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**INTENSIVE
RURAL HYGIENE WORK
IN THE
NETHERLANDS EAST INDIES**

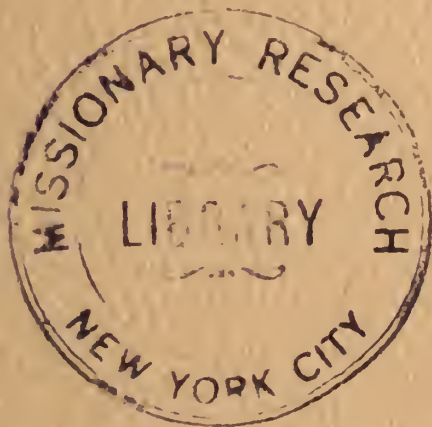
by

J. L. HYDRICK, M.D.

With an Introduction by

PROFESSOR J. SNAPPER

1944



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INTENSIVE RURAL HYGIENE WORK
IN THE NETHERLANDS EAST INDIES

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THE NETHERLANDS INFORMATION BUREAU

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INTENSIVE
RURAL HYGIENE WORK
IN THE
NETHERLANDS EAST INDIES

by

J. L. HYDRICK, M.D.

With an Introduction by

PROFESSOR J. SNAPPER

This study has been reprinted, with slight revisions, from a report of the Public Health Service of the Netherlands East Indies, published in 1937. It was submitted as a document for the Eighth Conference of the Institute of Pacific Relations, December, 1942.



July, 1944



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INTRODUCTION

Since the middle of the 19th Century the Government of the Netherlands has carefully organized the Health Service of the Netherlands East Indies. The high scientific standing of the physicians and other medical officers who have been working in this Service is easily demonstrated by their important contributions to the field of tropical medicine and hygiene.

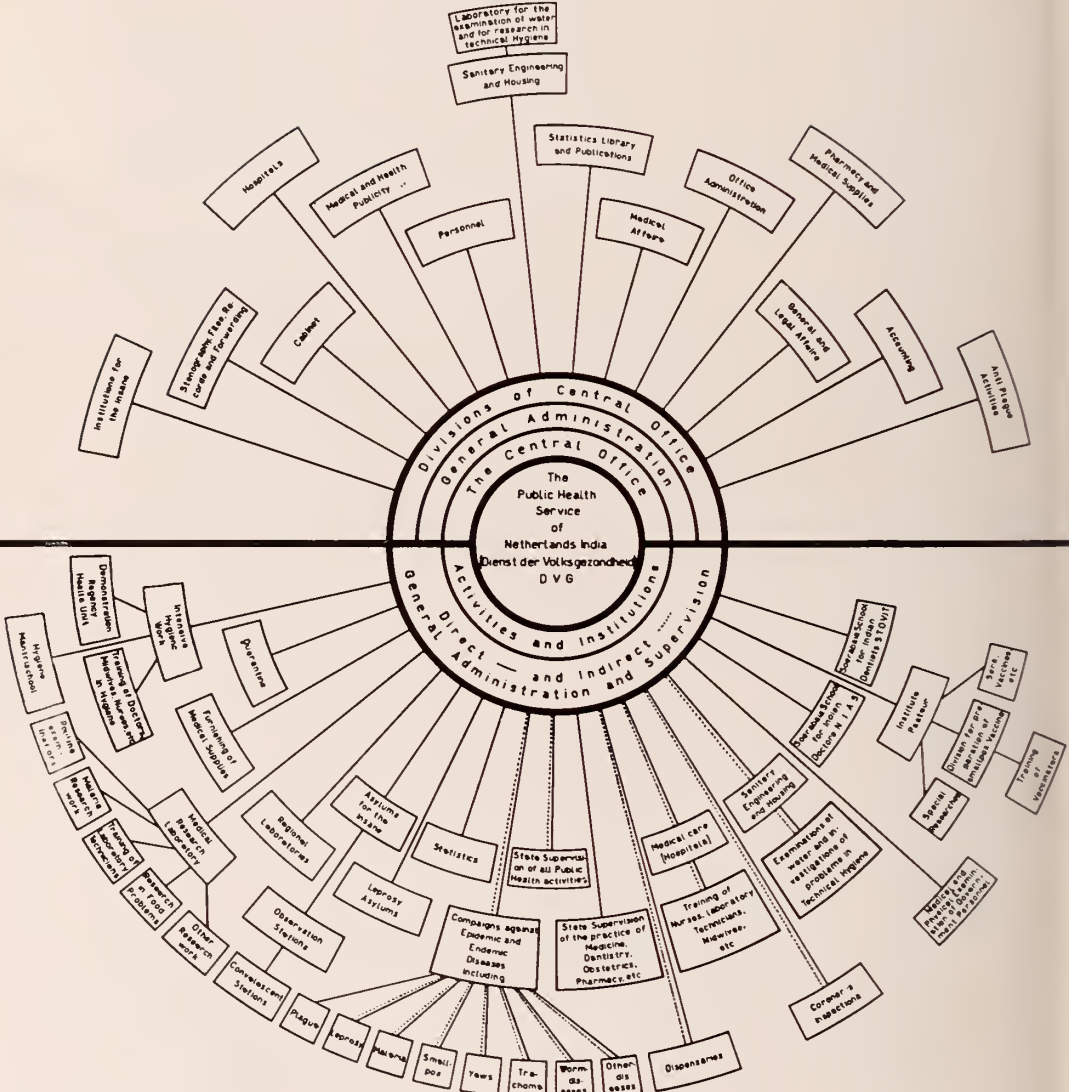
Here may be mentioned:

- a. The discovery of the avitaminoses in general, of avitaminosis B in particular, by Eykman.
- b. The isolation and crystallization of pure vitamin B¹ by Jansen and Donath.
- c. The investigation in the field of malaria prophylaxis by Swellengrebel and by Walch.
- d. The demonstration of the relation between dysentery amebae, tetragenes cysts and minuta cysts by Kuenen and Schüffner.
- e. The leptospira work of Schüffner and his pupils.
- f. The demonstration of the role which the construction of the Javanese houses plays for the propagation of plague by Van Loghem.
- g. The use of living plague vaccines by Otten.
- h. The study of the bloodchemistry and the metabolism of the Indonesian population first by de Langen, later by Radsma.
- i. The reputation of the Medical School of Batavia.

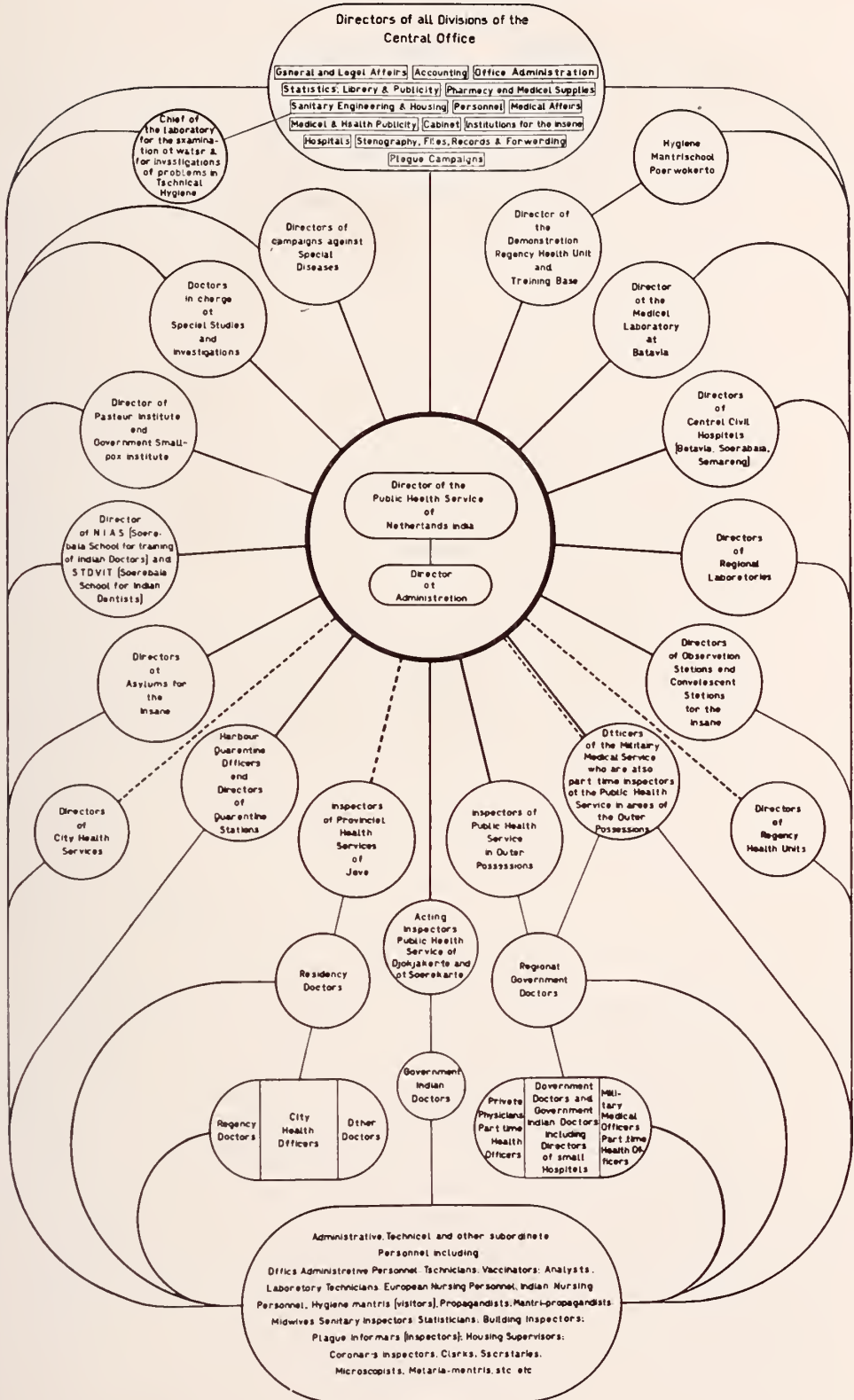
Gradually the Public Health Service of the Netherlands Dutch Indies has spread over many fields as shown by the following diagrams, and experts of different countries have expressed their appreciation of the results which have been accomplished by this Service.

In recent years several reorganizations have still increased the efficiency of the Netherlands Indies Health Service,—one of these improvements being the complete separation of a curative Medical

Divisions, Activities and Institutions
of the
Public Health Service of Netherlands India



Personnel of the Public Health Service of Netherlands India (Dienst der Volksgezondheid)



Service from the Public Health Service. The officers of the latter division are now in a position to devote all their time and energy to purely preventive Public Health work. Thanks to this complete separation, which until the present has nowhere else been realized than in the Dutch East Indies, it has been possible to organize intensive rural hygiene work in the Archipelago. One of the leading principles of this part of the public health program is to use methods apt to stimulate the interest of the native population and to obtain their active cooperation. At the same time the activities of the Public Health Service of the Netherlands East Indies have been decentralized: hospitals, dispensaries and campaigns against communicable diseases have been transferred to Provinces and Regencies. These measures have led to remarkable results which have been described by Dr. J. L. Hydrick. The importance of this rural health work in the Netherlands East Indies is clearly demonstrated by the fact that Dr. Hydrick's book has been translated in French by the Public Health Service of Indo-China with a highly laudatory commentary by Dr. Dorolle.

We here present a reprint of the greater part of Dr. Hydrick's monograph. The excellent quality of this rural hygiene work which evidently is only a minor part of the widespread activities of the governmental Health Service of the Netherlands East Indies may serve as a signal token of the superiority of the work of this Service.

J. SNAPPER.

Intensive Rural Hygiene Work and Public Health Education

of the

Public Health Service of the Netherlands East Indies

THE BEGINNING

On 20 April 1916 the Director of the Civil Medical Service of the Netherlands East Indies included, in a memorandum of that date, the statement that the influence of medical treatment of the sick upon health in general is slight, because this treatment can never reach more than a very small fraction of the people who are sick.

(“De invloed uitgaande van individueele ziekenbehandeling op den algemeenen gezondheidstoestand is, doordat die behandeling nooit meer dan een zeer kleine fractie der onder de bevolking aanwezige zieken kan bereiken, gering.”)

In 1920 a Division of Publicity of the Civil Medical Service was organized. Films were produced and posters and booklets were distributed, but the program was soon discontinued.

In 1925 the name “The Civil Medical Service” (Burgerlijke Geneeskundige Dienst) was changed to “The Public Health Service” (Dienst der Volksgezondheid).

In 1924 it was decided to begin again a special program for health education. As a means of studying the factors which should be considered in the organization and development of public health educational work and hygiene in the Netherlands East Indies, there was conducted in Java in 1924 a general survey for hookworm disease. During this survey films concerning hookworm disease were shown, and lectures illustrated with charts, lantern slides, etc. were given in many places. House to house visits in many villages gave opportunities to study the customs and habits of the people. The interest awakened by this work seemed to show that it would be possible to obtain good results with activities based on educational methods.

PRINCIPLES LAID DOWN IN THE BEGINNING

The idea underlying the organization of this intensive hygiene work was the belief, that if *health education could instill in the people an understanding of the fundamental rules of hygiene and a realization of the importance and necessity of healthful habits of life, many diseases and conditions might be brought under control and in time might be eradicated.*

Also it seemed most probable that if the interest of the people could be awakened and held long enough to establish this understanding of some of these elementary rules, the carrying out of further health measures would be far less difficult since the cooperation of the people would then have been secured.

However, the teaching of even the most simple hygienic rules is not easy, because it means in most cases that people must be asked to make changes in their manner of living and it is only too well known how extremely difficult it is to bring about a change in habits of life.

The population of the Netherlands East Indies is made up of many different groups who speak many different dialects and have many different manners and customs. Therefore, the methods and materials which were to be used in this health educational work had to be carefully devised, accurately tested, and frequently revised.

PURPOSE

The purpose of the work is to *awaken in the people a permanent interest in hygiene and to stimulate them to adopt habits and to carry out measures which will help them secure health and remain healthy.* The man who lives in the city can drink water from the tap without being obliged to know the details of how it has been made safe, but the man who lives in a rural area must be taught how he can make his drinking water supply safe. The city dweller uses the latrine which the builders of his house have constructed. The man who lives in a rural district must learn how to build a satisfactory latrine, and often he must also learn to use it.

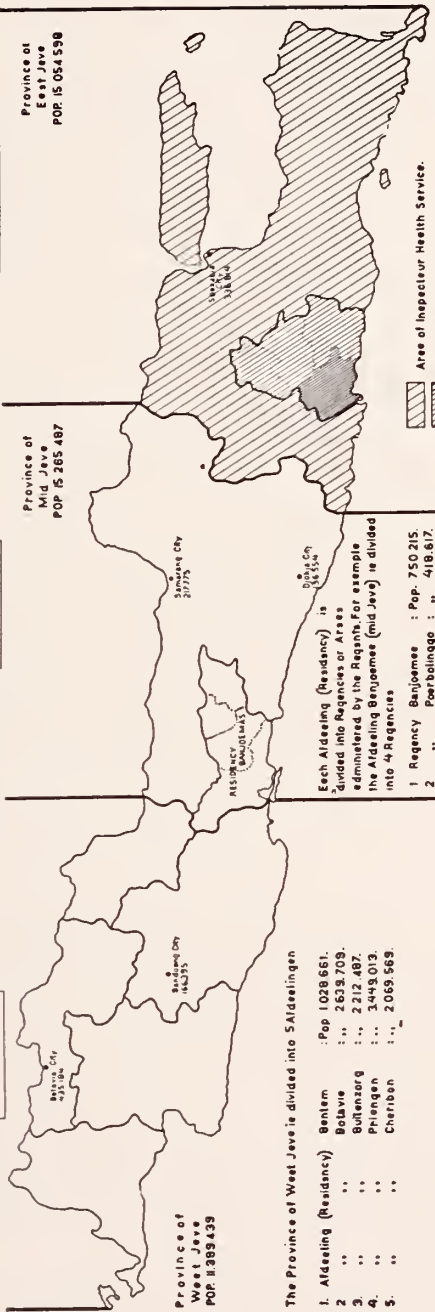
COOPERATION OF THE PEOPLE

In order to secure the cooperation of the people, health educational work must propose practicable measures, so that the people will be able to give cooperation. Further it is of the greatest importance that not only the children be taught hygiene and health,

England
Population
37,200,000
Census
1930
131,757. □ KM

Jave
Population
41,719,524.
Census
1930
131,441. □ KM

New York State
Population
12,500,000
Census
1930
127,333.3 □ KM



Province of
West Java
POP 11,389,439

Province of
Mid Java
POP 15,265,487

Province of
East Java
POP 15,054,598

The Province of West Java is divided into 5 Afdelingen

1. Afdeling (Residency)	Benteng	Pop 1,028,661.
2 "	Bekasi	" 2,639,709.
3 "	Buitenzorg	" 2,212,487.
4 "	Pringseng	" 3,449,013.
5 "	Ceribon	" 2,069,569.

Each Afdeling (Residency) is divided into Regencies or Areas administered by the Regents. For example the Afdeling Bantjenegara (mid-Java) is divided into 4 Regencies

1 Regency	Bantjenegara	Pop. 750,215.
2 "	Poerboedjo	" 418,617.
3 "	Bendjarenegara	" 283,718.
4 "	Tjilatjap	" 570,740.

1930 Census.

Area of Inspector Health Service.
.. .. Residency Doctor
A Regency Gov. Ind. Doctor

but that also the adults be taught at the same time, so that each group will support the other. This cooperation is very valuable.

THE SPIRIT OF THE APPROACH

The method of approaching the people is important and especially important is the spirit in which this is done. People do not like to be lectured or instructed or told too bluntly about their incorrect habits. *They should be lead, not driven. They should be stimulated and lead to express a desire to live more hygienically. It is the task of the health worker to create this desire.*

PROGRAM FOR HEALTH EDUCATION

To study methods and materials, to try to awaken in the people a permanent interest in hygiene, and to obtain thereby their realization of some of their own health problems, in 1925 the Division of Public Health Education was organized for which the following program was outlined:

To test methods and materials already used in other countries for health education; to change these methods and materials whenever necessary to make them suitable for use under local conditions, to develop new methods and prepare new materials; to begin the field work in rural areas with an attempt to teach the people a few fundamental, but simple hygienic rules of life which they themselves could carry out; to begin the campaigns on a small scale in order to keep the cost of work and the cost of necessary changes within reasonable limits; to extend the work slowly and only as results justified extension.

It was planned that with this work as a basis, the local programs in some of the rural areas would be extended and gradually developed into small health units.

A SUBJECT WITH WHICH TO BEGIN

At first thought it would seem that such work might best be begun with a general program, but experience has taught that this requires the discussion of so many different subjects at the same time that confusion follows, especially among peoples who do not grasp new ideas quickly.

Since a general program includes too many subjects to use in beginning the work, it was necessary to decide whether it should be begun with the teaching of the facts which are concerned in the prevention of the spreading of an acute disease, or with an attempt

to bring about in the people an understanding of the fundamental facts involved in the cause, transmission and prevention of a widespread chronic disease.

The attention of the public can be held only for a short time upon an acute disease which appears suddenly, runs its course in comparatively short time, and is temporarily eradicated by a treatment campaign. A chronic disease is better for use in holding the attention of the people for the purpose of teaching hygiene and securing permanent interest in health work.

Furthermore by reducing the spread of a chronic disease, the physical condition of the people is improved. Malaria, worm diseases and other chronic diseases lower physical condition and when resistance is lowered Tuberculosis often develops.

If the people can be taught that they themselves can carry out certain simple measures which will help them to avoid one of the chronic diseases, they will learn to live more hygienically and thus build up their resistance to many other diseases.

The diseases which are most widespread in the Netherlands East Indies are those which belong to the great group of intestinal diseases or filth borne diseases. In the ordinary living habits of the people of the rural areas, the pollution of surface soil and streams is far more common than the use of latrines. Of all the diseases which are spread by soil and water pollution, the worm diseases are not only the easiest to explain and demonstrate, but are also the most widespread over the East Indian Islands. It is easy to explain the essential steps in the cycle of infection and development. The explanation that worms live in the intestines and lay eggs which reach the ground with the feces; that on the ground these eggs develop into tiny larvae which in various ways reenter the body of the same person or find their way into the bodies of others; and that these larvae finally reach the intestines and there in turn become adult worms and lay eggs,—is a cycle or life history the main points of which are easily understood.

By securing in the people an understanding of the manner of spread of worm diseases, there is created the realization of the danger of soil pollution and a realization of the need of rendering human excrement harmless. It is then easier to explain the necessity of the use of latrines. Soon follows an opportunity to explain that the use of latrines is a step toward the prevention of all filth borne diseases and then a little later there may be begun an attempt to awaken an interest in further hygienic habits of life.

LAYING THE FOUNDATION FOR GENERAL HYGIENE WORK

If these new sanitary habits become permanent then there has been laid the foundation upon which general hygienic work can be built. For example a field worker must frequently revisit the houses of the area under his control to see if the latrines are properly used and cared for, and he has then opportunities to speak with the people not only about improvement of the latrine, but also about other hygienic rules. At such visits he can take up the use of mosquito nets, since the need and great convenience of a mosquito net can also be easily explained and demonstrated, or he can discuss the use of boiled drinking water or some of the other hygienic habits.

It was therefore not intended that the Division of Public Health Education should conduct only a campaign against soil and water pollution, but that it should thereby lay a foundation for a broad general campaign for hygiene by teaching the dangers of the pollution of soil and water.

CHANGING HABITS

This is a most difficult task, because to convince the people of a rural area in which the work has just been begun that they should stop soil and water pollution, means convincing them that they should stop following habits of life that have been followed for ages. It is universally true that the tendency of man to follow the customs and habits of his neighbors is so strong that measures which require him to adopt a new habit, even though the change be for his own benefit, can not be easily carried out, but must be explained carefully until they are well understood and their necessity is felt.

The realization of the need for changing old insanitary habits must be based on an understanding of the reason for changing. Therefore, though mass treatment of a population for a disease gives a temporary improvement in health and thereby confidence in modern medicine, the best results, namely those of a permanent nature, can not be obtained by such a campaign alone, because the people do not learn enough about the manner in which the disease is spread and their habits remain unchanged.

ACTIVE INTEREST

Whatever methods be used they must stimulate in the people an active interest. Passive interest would die out too quickly. If the work concerns latrines, the people must build them and pay for them themselves. If the latrines are built for the people or if they are

given money to help them build the latrines, they will most probably not use them or care for them. If the work concerns mosquito nets, the people must buy their own nets; they should pay for their injections of salvarsan for yaws; and in general, should always have to work for or pay for the object or service which they obtain.

All available materials and methods which are suitable must be used, because superstitions, prejudices and misunderstandings hinder the formation of hygienic habits of life. The changing of the old habits will take place very slowly and the new habits will be permanently secured only if those who try to bring about the changes are patient and tactful.

The methods which are used, however, must be as simple as possible and must not be spectacular. Spectacular methods are not often successful in teaching people what they can do to promote their own health.

DR. C. E. TURNER "HEALTH EDUCATION"

Dr. C. E. Turner, Professor of Biology and Public Health at the Massachusetts Institute of Technology, and Chairman of the Health Section of the World Federation of Education Associations, wrote in a letter of January 14, 1936, the following note:

"Doing things to people is often easy, but it is expensive and of temporary benefit. Showing people how to do things for themselves may take a little time, but it is relatively inexpensive and its results are lasting. Moreover the people are strengthened by the latter process and weakened by the former."

Man's natural desire to relieve suffering, and the clinical approach to public health problems have commonly resulted in the expansion of *treatment programs which might be extended to consume the whole national budget without achieving their objective. The great hope for public health within budgetary limitations lies in securing more healthful living on the part of the people."*

GRADUAL EXTENSION AND DEVELOPMENT

Field work must be built upon a solid foundation and therefore should be very slowly developed because it concerns the changing of age old habits which will be taken up again if the new habits are not continued long enough to be thoroughly implanted.

The work should not be begun in a district, carried on for a certain time and then stopped, but an area in which hygiene work has been begun must always remain under supervision. The results

which have been secured must be studied and used as the basis for the organization and development of further activities.

COERCION

Development will occur, though slowly, if without the use of coercion, *the people are brought to realize that it is for their own benefit to change their insanitary habits for more hygienic habits.* Of course, in every group of human beings there are a few reactionary individuals who cannot be convinced that they should adopt anything new. Such members of a population group can *at a later date be controlled by laws and regulations which in the beginning are premature.* but later will be needed when the public opinion is strong enough to support them and make them valuable for the protection of the group against the reactionary individuals.

An attempt to carry out *hygienic measures by beginning with the use of force gives rise to active and passive resistance* which always accompany the enforcement of any law which is not supported by public opinion. Therefore any attempt to bring the people to a more hygienic manner of living should be made not by means of laws, but by educational measures. Although great patience and devotion are required of those who carry out such programs, the results obtained seem to be permanent and therefore repay the difficult work.

In the beginning of the work in the Netherlands East Indies there was much discussion concerning the use of force. Many thought that better results could be obtained in a shorter time by the use of laws and measures of force. In order to give all possible methods a trial and to satisfy those who supported these claims, a post in a certain residency was organized by a residency doctor and the campaign carried out on the basis of coercion. Laws and ordinances were passed, and fines applied, but the work only received the passive resistance of the people. For example, in regard to the prevention of soil pollution, the people were compelled to build latrines, but they could not be compelled to use them. When, after a few months, it was realized that the desired results could not be secured in this way, methods of education were applied in some of the areas and in these places the people began gradually to use their latrines.

In other stations where only educational methods were used, the results obtained were much better. Fewer latrines were built and the areas under control were much smaller, but most of the latrines which were built under the educational methods, were used and well cared for. In other words those who built latrines built them

with the idea of using them. Later, after public opinion in these areas is strong enough, laws may be used to support and protect those who are trying to develop and follow hygienic habits.

It is, of course, possible to compel people who live in rural areas to build fences around their houses; to exchange the thatched roofs of their houses for tiled roofs; to sweep their yards clean; to build latrines or heed orders which can be carried out under direct supervision. However, people cannot be compelled to change their personal habits, as for example to use a latrine or to drink boiled water, unless the reasons for these changes in habits have been thoroughly explained and they feel that the change is for their own good.

In conducting hygiene work in a city where conditions are quite different it is often necessary to use force. For example, the construction of latrines in a city is primarily a question which concerns the municipal authorities and the house owner, and not the tenant of the house. People who live in a city gladly use latrines which have been furnished for them, because the yards are so small that soil or water pollution becomes unpleasant. Health education would, of course, help the carrying out of measures in a city, but force is necessary to protect those who are willing to live properly against those who live unhygienically.

Moreover, in a city it is possible with the help of the police or inspectors to carry out the details of laws and to secure results. In the rural areas the distances are too great and in densely populated areas the jails are not large enough to make the use of force possible.

Also it is, of course, necessary to use force temporarily for quarantine, and at times during epidemics, but in the rural areas coercion should be used only to carry out measures which have already secured the support and the cooperation of at least 90% of the people of that area.

In order to secure results in rural areas one must use methods which secure the active interest and the cooperation of the people and teach them measures which they themselves can carry out to protect their own health.

Proper food, proper amounts of vitamins, etc. concern the people of many cities and rural areas of many different countries, but *no one can force these people to eat the proper foods.* They must be taught that certain foods are good for them and their cooperation in regard to this question must be obtained.

There would be no objection whatever to the use of coercion if its

use could secure permanent results. But it has been tried so often without success, and it is so much more difficult to secure the cooperation of the people after a failure due to the use of coercion that it is not advisable to begin with the use of force. Work should be begun with educational measures and coercion should be added only after the educational measures have built up a public opinion which is strong enough to give support to the measures of force.

Work based on coercion requires a large personnel to enforce all the rules and regulations and this makes it far too expensive.

If it were possible to secure results at a reasonable cost by coercion then conditions in all countries would be much better than they actually now are.

MEDICAL CARE AND HYGIENE WORK

Medical care should be available for the relief of suffering.

Medical care can be carried out by a central government organization, a local government organization, a society, et cetera, but it should not be included in the program of a Public Health Service.

The medical personnel and the personnel for hygiene-work should cooperate in many activities, especially those which concern prevention.

The teaching of hygiene can not be based efficiently upon medical care, but should be based upon educational measures.

Medical care and hygiene-work concern such different fields of activity that for efficient work there should be a different subordinate personnel for each field wherever this is possible.

It is quite possible that more efficient cooperation could be secured if the *Public Health Service* and the *Public Medical Service* of a country be placed under the *supervision of one general director*, but each service should have its own director and, in local areas in which it is economically possible, should have its own separate subordinate personnel.

A Service which purposes to improve the general health of a community, must concern itself with obtaining permanent results which usually can be secured only after a long period of time. The short campaigns against diseases and the campaigns for mass treatment of diseases are necessary during epidemics and to relieve those who are suffering from endemic diseases, but in order to improve the unhygienic conditions which exist in an area and to prevent diseases or to eradicate them, intensive hygiene work must be conducted over long periods of time.

Even when a program is begun with treatment work, hygienic habits and hygienic methods of life must be created in the family in order to make permanent the results secured through treatment and medical care. The sufferer from worm disease will be reinfected if he and his neighbors do not stop polluting the soil and water, and the sufferer from scabies will quickly get the disease again unless he changes his habits. This is clearly seen in reports of various activities, programs, and organizations, and yet there are still many who hold that treatment must be the basis of all health work.

The history of the campaigns for the eradication of yaws in various countries has proven that treatment alone does not secure permanent results. Many years ago, when the treatment campaigns for yaws were begun, the people soon learned that the skin eruption of yaws quickly disappeared after an injection of medicine had been given the patient by the doctor. Thus it was not difficult to get them to be treated, but it was difficult and still is difficult, to get them to return for the second or third or further injections before further signs or symptoms appear. Many methods have been tried to secure the return of the patient for the second or additional injections, but with very unsatisfactory results. In some places patients were required to pay for three injections with the hope that having paid for three, they would certainly return for the second and third. This and various other methods have failed. Only in places where educational work has been combined with treatment has it been possible to get the people to return for additional injections.

Furthermore, recent investigations seem to indicate that yaws is spread primarily among those who live under unhygienic conditions, so that its eradication will depend upon the adoption of more hygienic habits by the people. This will take place only after the people have understood the necessity for adopting hygienic habits.

Also there are still many who believe that curative medicine should not be separated from preventive medicine and hygiene. This belief is based on the idea that "a treated patient is a center of propaganda." *Even if it be granted that a treated patient could become a center of propaganda, he would only be a passive center of propaganda. At any rate a cured patient becomes only a center of propaganda for that special treatment which he has had for that particular disease from which he was suffering and not a center of propaganda for hygiene in general. Health work can not depend on*

such passive centers of propaganda, if permanent results are to be secured.

If one tries to make a list of the hygienic habits which have been created through treatment, the results are disappointing. How often are patients treated for a disease, but soon become reinfected with the same disease, because they have not changed their habits. Patients do not learn to avoid yaws by being treated with salvarsan; patients do not learn to avoid hookworm disease by taking the treatment; and sometimes patients do not even complete a course of treatment for a disease. Those who work in malaria areas report that patients who are being treated for malaria often fail to carry out the treatment to a complete cure.

The treated patient as a center of propaganda for general hygiene is as unsuccessful as the latrine constructed for the people is a center of propaganda for latrine use. There were many who thought that if the latrines were built for the people they would be used, but they were disappointed.

In almost every field it is claimed that positive methods are preferable to negative methods. Teaching hygiene by means of medical care is mainly a negative method. Medical care purposes to relieve those who are suffering from disease and tells them what they should not do. Hygiene works by telling the people what they should do and tries to prevent the spread of disease. *The two should cooperate, but the two aims are different: the methods are different; and differently trained personnel should be used wherever it is possible.*

It is, of course, very difficult to separate completely curative activities, preventive activities and activities which concern hygiene alone. *However, if there is no attempt to separate hygiene from curative medicine there remains always for those who have not had special training in hygiene, the tendency to emphasize treatment work. In this case the activities for prevention become too superficial.*

Wherever it is economically possible, curative medicine and hygiene should be separated, the curative activities being carried out by one personnel, and the preventive activities by personnel trained in hygiene. There must, of course, always be cooperation of the two groups, but each personnel, particularly the lower personnel, should be concerned only in one type of work.

On account of lack of personnel and money, it is sometimes not possible to separate the two services, so that upon one person

falls the double task of conducting hygiene work and medical care. However, both medical care and hygiene work would secure better results, each in its own field, if they could be conducted separately.

At any rate the separation must be required for subordinate personnel. It is quite understandable that the average person can best give his entire energies to one definite task. Most doctors of health services have been trained primarily for hospital and clinic work or for private practice. The most so-called "courses in hygiene," given in medical schools, in most countries do not prepare the doctor for real practical hygiene work. The interest of most doctors is therefore given to treatment, so that this is reflected in their work-programs.

It is really of the greatest importance that the subordinate personnel for hygiene work not be assigned treatment work at the same time, because there exists the inclination to give treatments and since treatment work is so much easier than hygiene work, the hygiene work is neglected. It has been proven that subordinate personnel can, without giving any treatment, secure the cooperation and the confidence of the people. This, of course, requires inexhaustible patience, tact and time, but the results secured by this method are well worth while.

It is far better to secure the cooperation of the people by means of hygiene work, because the results will then be more permanent.

In the health work in several rural areas in Java definite efforts are being made to emphasize hygiene and preventive measures. No curative activities are conducted in these areas by the personnel of the Health Units. *All curative activities are carried out by the personnel of the hospitals and village clinics. In these areas this system is economically possible.*

The idea that medical care must be combined with hygiene work has so long been accepted that most of the directors of preventive activities have not been willing to separate hygiene from medical care. *A great factor in regard to this point is also the fact that those who have once worked with activities that concern medical care will not willingly give up this attractive care of the sick which is satisfying to them to carry on hygiene work which is much more difficult and the results of which cannot be seen immediately, but will be secured much later. For this reason pure hygiene work is nearly always postponed. Medical care is much easier than hygiene work, it is more attractive, the results are immediately seen, the patients come to the*

doctors, and everything runs more smoothly than with hygiene work.

Those who plan to conduct real hygiene work should know that *not only the subordinate personnel, but also the people of the area to be served, must realize the difference between medical care and hygiene work. The people must understand that medical care, carried out by the personnel of hospitals and dispensaries helps them during the attacks of disease, but the adoption of hygienic habits and healthful ways of life will help them to avoid many diseases and in many ways improve their health.*

It is of the greatest importance that the people learn what they themselves can do to avoid diseases. It is impossible for any Government to give medical care to every person of an entire population.

The people must seek their health not in clinics or hospitals, but must try to find it in hygienic habits and hygienic surroundings. The hospital or the clinic must help them during their periods of illness.

It has also been proposed from time to time by doctors, that educational activities be conducted at dispensaries. Lectures or demonstrations given at hospitals, dispensaries, clinics, or to groups collected for vaccination for smallpox, injections against typhoid fever, or injections for yaws, fall on deaf ears. The children are usually frightened or crying, the parents are nervous and worried not only about the treatment, but also about what is happening at home during their absence. All this creates a general tension that prevents anyone learning anything from the lecture.

One definite relationship between hygiene work and medical care is that the *hygiene work insures a much more efficient use of the dispensaries and hospitals*, because the people learn to visit the dispensaries and hospitals as soon as symptoms appear and do not wait until they are seriously ill. Through health education and hygiene work they have learned that diseases are much easier to cure in the early stages.

The doctor who has been trained for hospital and clinic work or private practice has much interest in scientific investigations, special studies of diseases, methods of treatment, et cetera, and applies his knowledge to the individual. He uses his knowledge of psychology mainly in connection with the individual.

The doctor who is trained in hygiene work has more interest in epidemiology, endemiology, sanitation, immunology, statistics and similar subjects. His thoughts are centered not so much on the

individual, but on the group,—on the population of a village, or on that of a city, or on some other large group. When he uses psychology, he uses it in connection with large groups and not in connection with the individual.

For these reasons a doctor cannot easily carry out properly medical care for the individual and at the same time also conduct general hygiene work. The hygiene work which the curative doctor can conduct properly is hygiene for his individual patients, which he can combine with his practice.

It is only the exceptional person who would be able to divide his attention and time fairly between hygiene and curative work. This is one of the important reasons why the subordinate personnel, wherever it is possible, should carry on only one type of work. Members of the subordinate personnel can not be expected to be able to divide time or activities fairly between medical care and hygiene work.

In some rural areas a government doctor is expected to have charge of a small hospital, visit the clinics and rural dispensaries, carry on general private practice which includes surgery, obstetrics, etc., and conduct the local health program. In a place where the population is limited to a few hundred people, this may be possible, though not efficient, but in areas where the population is dense, this system is far too superficial.

In many countries in small towns, where only one doctor lives, this medical man must carry on general medical practice, perform surgical operations, practice obstetrics and sometimes even practice dentistry. However, where it is economically possible the people demand surgeons, obstetricians, dentists, and specially trained personnel for health work.

No one expects that hygiene work will close hospitals and dispensaries or do away with the practice of medicine, but well conducted hygiene work will secure more efficient use of dispensaries and hospitals and give practising physicians an opportunity to work more efficiently.

In contrast to the person who lives in unhygienic surroundings and has unhygienic habits, the person who lives in hygienic surroundings and has hygienic habits, has fewer diseases, has better physical resistance, consults the doctor as soon as dangerous symptoms or signs appear, and thereby makes the treatment of diseases and conditions easier and more efficient, and helps to lessen the general cost of sickness.

"In the promotion of human health we gain little or nothing by the treatment of disease, for at the best this is merely a palliative. It can never be very successful even in its avowed object of restoring health to those who have lost it, because what we call disease is in reality not disease itself, but its end product. This does not refer to those acute diseases which are self-limited reactions. Here, improvements in treatment will do much to keep them within the bounds of physiology, so that they neither kill nor permanently damage us. But for those diseases which are not self-limited, for the results of long continued adverse factors which produce structural alterations of a permanent character, or which call for mechanical interference to preserve life, the future can give us little more than the past. —Dunstan Brewer, D. P. H., Ann. Rep., Medical Officer of Health for the Year 1935, Borough of Swindon, p. 7"— From the American Journal of Public Health page 1124 of volume 26 November 1936.

The surprising point is that if the authorities realize its importance it often becomes economically possible to have special personnel for health work in places in which it was formerly considered impossible.

Those whose interest lie in the field of medical care can not realize that those who work in the field of hygiene can be satisfied with the results that are being secured. As time goes on, the results will prove that, in spite of the slowness of its progress, hygiene work is worth while, and deserves to have a specially trained personnel.

From "American Journal of Tropical Medicine," Vol. 15 No. 1—Jan. 1935 "The Educational Background for the Practice of Tropical Medicine" by F. F. Russell:

"Until quite recently the only attempt to raise the general level of health was made by missionary and other voluntary workers and associations, but their effort was almost always limited to setting up hospitals and dispensaries for treatment. In many tropical countries that is the situation found to-day. In our own tropical possession, Puerto Rico, the Presbyterian Hospital has done a *large amount of very good curative work for many years; however, it is easy to see that no matter how good that work may be it will have very little effect on the general health on the island.* For this reason Puerto Rico and many other tropical regions have come to realize the need of official government action in preventive medicine and hygiene, and

health departments are being set up on the model of the best in highly civilized nations.”

From “Medical Services at Home and Abroad” by Professor W. W. Jameson of the London School of Hygiene and Tropical Medicine:

Page 217:

“No government can hope to supply all the hospital needs of a colony and, valuable as a good hospital scheme is as an educational and political factor, it has little effect on prevention of disease and on raising the general standard of hygiene upon the improvement in which the control of so many tropical diseases depends.”

Page 219:

“A child welfare clinic conducted by a medical person, male or female, is apt to become little more than a treatment center in a country where ill health is the rule rather than the exception.”

Pages 220—221:

“There is a tendency in some quarters to side-track progress in sanitation by substituting methods of control of disease based on laboratory findings. Anti-typhoid, anti-cholera and anti-plague inoculations have an important, if temporary, place in preventive work, but good sanitation is a permanent safeguard and should be advocated in season and out of season.”

From “Should Public Health Administrative Practice include Medical Relief Activities”—*American Journal of Public Health*—September 1934:

Page 942:

“The inculcation of proper principles of housing, living and working conditions, and the cultivation of health habits in our population are of vital importance in the reduction of sickness and death rates and the promotion of health, efficiency, and longevity.” . . .

Page 944:

“While it is the duty of the public health department to direct attention to ill health or to physical defects, it is not its duty, except in control and elimination of communicable infections, to furnish treatment of sickness or correction of defects

for any. Those able to pay are referred to the private professional; the near indigent or the indigent are referred to charitable sources. In those communities able to afford educational or health centers under public health auspices, it has been found in numerous instances that the *conduct of a charitable treatment clinic upon the same premises creates a marked decline in general public attendance and demand for educational facilities.* The person of moderate means avoids the least inference or implication of charity; others fear known probability of contact with the sick. These remain away and they constitute many times the number of the indigent. *The health center becomes only a sickness or disease center and its entire intent of prevention is lost.* The department as a health promotion agency is a failure and economically unsound."

THE SEARCH FOR EASY METHODS

It is only natural that those who organize health work seek methods which are easy to carry out. For this reason many try to begin a program by organizing a center for infant hygiene. This type of apparently easy work is attractive, interests the public, and secures the support of local committees, but the difficulty is that the organizer is liable to place too much emphasis upon this one activity, so that the development of a general program is postponed.

This activity is easy for the doctor, because it is usually carried out by a midwife, and the doctor need give only a small amount of his time to supervision, but he should realize that, although a certain amount of good work will be done by such a center, it is not advisable in the beginning stages of the work to place too much emphasis on the center activities alone.

In the beginning of a program, hygiene must be carried to the family house in order to improve home conditions and thus support properly the work of the centers which are to be established at the same time or later. The results secured will be much better if home conditions are improved at the same time that the centers are established, so that the mothers of the infants can apply in their homes what they learn at hygiene centers.

The easy methods are generally not advisable. For example, to persuade the village people that they must build and use latrines claims much patience, tact and time. Sometimes the doctor in charge of this work loses his patience and decides that it will be easier and better to have the latrines built for the people in the hope that

they will certainly use them if they are built for them, but this is very seldom successful. On the other hand, if the village man builds his own latrine, he will be more interested in keeping it in good condition and in using it.

Sometimes, after a doctor has worked for a time and realizes how difficult hygiene work is, he hopes to find an easy way by the education of children. He considers the adults as hopeless and gives his entire time to work with the children under the motto that "the child of today is the adult of tomorrow." *However, he forgets that the child of today is still under the influence and supervision of his parents. He also forgets that a child learns quickly, but also forgets quickly.*

Hygiene work with children is very attractive, but is often over-emphasized and over-estimated. It must be combined with the education of the adults, in order that each group will support the other. If children learn anything about hygienic habits, they are able to bring this knowledge into practice only if they secure the cooperation and the support of their parents at home.

THE SYSTEM AND PERSONNEL

Not only the system and the methods, but also the personnel must be of the right sort if one expects to secure permanent results. One might be able to create a good system, but would not be able to secure success without properly trained personnel. This is true in any sort of work.

Sometimes doctors attempt to begin hygiene work with untrained personnel and when results are not satisfactory, claim that the system is at fault. It is especially important that the director of a program have a thorough training in order that he may be able to supervise his personnel, prepare his program, and see that the activities assigned to this personnel are carried out with the proper technic.

METHODS

In the small villages all the news goes by word of mouth, so that, in order that it might appeal to the people, the intensive educational method was based in the beginning on the same system. It has been found that *direct contact with the people is best attained and the best results can be secured by the house to house visits* at which various subjects are discussed with all the members of the family. This rather difficult work can be carried out only by men and

women who have been specially trained for the purpose. The qualifications which should be possessed by one of these health workers are given in detail in a separate section of this article.

Before the intensive work in a district is begun, special lectures and demonstrations are held for the village authorities. At these lectures and demonstrations the methods used in intensive health work are explained and the principles and ideas upon which the work is based are described in detail. Much time is given to explaining to these authorities the reasons why coercion should not be used in any form whatsoever in the beginning of the work. *They are also told why it is so necessary that the people learn to do as much as they can for their own health.*

Other lectures and demonstrations are held for special groups such as school teachers, societies, and pupils of the school for the training of native officials, to secure their interest and cooperation.

The intensive work is then begun. The hygiene mantri begins his work in a village with a general survey. He visits each house in the village, gives each house a serial number and enters it on a sketch map of the village which he has drawn. He notes on a special form the condition of house and yard, and also records, in as far as this can be obtained by questioning the various members of the family, a short medical history of each member during the five years preceding the survey.

At the beginning of this general survey the hygiene mantri is accompanied by some member of the village government who introduces him to the people. This introduction serves only to make known to the people that the hygiene mantri has permission to work in the village and that he is someone who can be trusted. *Thereafter the hygiene mantri goes about his work alone in order to avoid any possible suspicion of the use of force. The presence of anyone from the village government after the first visit of the mantri might be misunderstood by the people and interpreted by them as an evidence that coercion is to be used.*

THE HOUSE-VISIT

In the intensive work the mantris visit the people house by house. *This house visit is the most valuable form of education. It is a method which has been planned for the members of one household alone and must be used in the proper way.*

If there are persons from another family or from another house

present, there is not the free questioning and discussion which is the basis of the method. The mantri must talk, but *his special work is to use his models, photographs, charts, et cetera, to make the people in this small group discuss the subjects with him.*

As an example of the many small points which are of so great importance in the development of this work which is really built upon details, may be mentioned the fact that the people show far greater interest in what the mantri has to say if they are allowed to have the charts, models, et cetera, in their own hands. The physical contact with the photograph or model gives a more direct mental contact.



The most valuable method of carrying on health education is the house-visit

The mantri must never lose patience; he must answer every question no matter how foolish it may seem; and he must use very simple language, simple explanations, and no large or technical words. The more he makes the members of a family talk, the greater interest he awakens and the better results he will secure.

Another very interesting point which has its origin in the old history of Java concerns the strongly developed feeling of caste. In earlier times it was a habit of those of lower rank to squat in the



Public lectures are not of great value



presence of those of higher rank. If during his visit the mantri remains standing or allows the members of the family to squat before him while he sits upon a chair, he remains on a higher plane and the members of the family do not dare to ask questions. On the other hand, if he squats with them or sits down with them on a large bench, they are at once more at ease, and feel that they may freely question him and discuss things with him.

Emphasis is placed on the fact that the house visit must not be too long, and in the beginning of the work must treat of only one subject at a time. Since the mantri must not tire the people and it is impossible for him to cover a subject completely at one visit, he must work in an area for a long time, make frequent visits to each house, and discuss the same subject many times.

PUBLIC LECTURES

Public lectures given in the villages during daytime are illustrated with charts, models, drawings, et cetera, but when they are given in the evenings, lantern slides and motion pictures are used. Experience has taught that of whatever sort the lecture may be, it should never be very long, should not include technical terms, should be given in the most simple language that can clearly express the subject, and in the beginning of the work should concern only one subject. However simple the lectures may be, it will in the beginning, not only concern subjects which are new to the village people, but will also suggest the following of new ideas which are contrary to those which underlie age old habits of life. Therefore the lectures and demonstrations upon any subject must be frequently repeated if they are to awaken interest and keep it active.

Even at best, public lectures awaken a temporary interest, so that they are not considered a very valuable method of public health education in rural villages. If they are given, efforts should be made to make the audience take an active part, either by asking questions or examining charts or objects.

Demonstrations with the microscope, with models, et cetera, are given sometimes alone and sometimes along with the lecture to explain better the subject discussed at the lecture. For example, if the subject is hookworm disease, the hookworms and living larvae are shown under microscopes, and sometimes samples of soil are placed in a simplified Baermann apparatus to demonstrate the presence of living larvae in the soil.

PRACTICAL DEMONSTRATIONS

Practical demonstrations are also useful. Sometimes workmen are hired and a complete latrine is constructed somewhere in the village as a model. Through this demonstration, which is announced beforehand, many people learn the details of the construction of a latrine. Sometimes seamstresses are hired to make a few mosquito nets, so that the people can see the proper way to make them and learn the proper method of hanging them in the house. Sometimes as a demonstration a few houses are whitewashed inside and outside.

MATERIALS

The materials used in intensive hygiene work are of great importance. They must be easily understood by the village people and therefore must deal with simple subjects. Naturally, those that have been changed to suit local conditions are the most useful.

All sorts of materials have been tried, many have been discarded as inefficient and those still in use are being improved and further adapted to suit the needs that have developed.

In Europe and America much can be done with printed leaflets, pamphlets, newspaper articles, et cetera. In the Netherlands East Indies it was necessary to use other methods not only on account of the high percentage of illiteracy of the rural area, but also because of the language difficulties. The people in West Java speak Sundanese; those in Mid Java speak Javanese; many in East Java speak Madurese; and those of other islands have other languages. Each small division of a residency has its dialect so that printed leaflets, pamphlets, et cetera, would have reached only a limited group.

Printed leaflets written in dialect have been used in some areas by local doctors in the hope that they might help, but the value of the distribution of printed matter is usually overestimated.

Thus an important item in the beginning of the organization of the work was the search for and the testing of other materials which could be used in teaching the people.

It has been learned that the models, charts, lantern slides and films are of far greater value if they show persons, objects and scenes taken in the areas in which they are used. The people are so bound by their own customs and ideas that it is necessary to express new ideas, as far as possible, in terms understandable for them. Even these materials, the majority of which show objects

familiar to the people, must be repeatedly and carefully explained by the field worker.

The people of the rural areas of the Netherland East Indies very seldom see photographs and drawings and therefore do not understand them at once when they are shown to them. To the village man a photograph or a drawing has no depth. Therefore the lines and other details have very little meaning for him until they are thoroughly explained by the health visitor. After the photographs and drawings have been explained, their meaning becomes clear.

The image thrown upon a screen from a lantern slide has more depth and is therefore more easily understood.

FILMS

Since the film shows moving objects, living persons, animals, et cetera, the projection of the film on the screen, in as far as it concerns the number of people, houses, trees, et cetera, which are shown, is still more easily understood, but the scenes of the films pass so quickly that the lesson which should be taught by the film is not so well understood.

Films taken in Europe or America do not attract and hold the attention as well as those taken in the area in which they are to be shown. Since most of the village inhabitants are illiterate and each district has its own dialect, the film titles are very rarely read and for this reason, during the showing of the film, a trained mantri must give an explanation in the dialect of the area. It is, of course, inadvisable that the scenes of the film be too long, yet, on the other hand, experience has taught that for the ordinary audience of a rural area the film scenes must be much longer than those of films to be shown to the people of a city.

Wherever attempts have been made to conduct public health education work exclusively with films, the results have been disappointing. A film creates a certain amount of interest which, however, disappears very quickly. Experience has also shown that hygiene work can be conducted without the use of films. In one area in Java hygiene work was successfully carried on for more than a year without any films having been shown during that period.

The work in an area must not be begun with films, but with house visits. After the campaign has been begun and a certain amount of progress has been made, *the film may be used to stimulate more interest or to sustain the interest which has been awakened by the ordinary activities of the program.*

The film is, of course, very good material to be used for additional training of mantris, for courses for school teachers. or for special groups.

LANTERN SLIDES

The rays of light of a good magic lantern give life to the image of a lantern slide projected upon the screen making this a valuable means of reaching a small group of people. Naturally, the projected pictures of colored lantern slides are far more effective than those of black and white slides. Since the projection from a lantern slide can be kept upon the screen for several minutes, the mantri has an opportunity to explain the projected picture in detail. It is for this reason that, where the work is in the early stages, the lantern slide is of more value than the film.

MICROSCOPES

Microscopes are useful for giving demonstrations to small groups of people, but these *demonstrations must be preceded by a very careful explanation concerning magnification.* The people are first taught to put small objects behind a glass of water to see how the glass of water magnifies these objects. They are then shown how one magnifying glass magnifies, and that a set of two magnifying glasses has a much greater effect. Then they are shown that a microscope consists of many magnifying glasses and is therefore able to make visible bacteria, which are invisible to the naked eye. They can then understand that they can not see the bacteria which they have on their hands.

DEMONSTRATION CHARTS

For house visits and demonstrations the mantris use specimens, photographs and charts. The ordinary black and white photographs and charts are not quickly interpreted by people who have rarely or never seen photographs or pictures and therefore these must first be carefully explained by the mantri. Colored charts are much more quickly understood, because the colors give depth and contrast to the details. The chart is also of great value, because at the time of the house visit they are given to the people who hold them in their own hands.

DEMONSTRATION AUTOMOBILES AND HANDCARTS

In the beginning of the work demonstration automobiles were used to carry from place to place collections of materials such as

films, generators, lantern slides, models, microscopes, charts, et cetera, so that lectures and demonstrations could be given in any village reachable by an automobile. The automobiles have been discarded. The disadvantages of the automobile were large running expenses; repair costs; difficulties with chauffeurs; the tendency of some of the directors of units to try to reach with the automobile an area which was far too great for the other personnel; and the tendency to conduct health education only by showing films.

Instead of automobiles, small handcarts have been designed and put into use. Such a handcart has a very small carrosserie and four very small automobile wheels. In this cart there is room for a film projector, an electric generator, films, a magic lantern, tools, et cetera. The cart is very light and can be brought from place to place by two workmen at a very small expense.

The advantages of the handcart are that no chauffeur is needed; the running expenses and repair costs are low; the handcart can be taken to villages which are not reachable by automobile; and most important of all, the area which can be served with a handcart is small and therefore not too large for the other personnel connected with the work.

THE FIRST INTENSIVE UNITS IN THE NETHERLANDS EAST INDIES

After the close of the general survey which was begun in 1924, the first field station was organized in May 1925 in the Residency Bantam; in June 1925 work was begun in the Residency Banjoemas; and in July 1925 in Djokjakarta. Other field stations were established in 1926, 1927, etc.

BUDGETS

The activities concerning the prevention of soil and water pollution begun in 1925 were so organized that they could be used as a basis for building up small health services. In 1926 it was possible to secure for the health educational work, budgets from several residences. Later on when the residency councils were abolished, the budget and personnel of a residency in which hygiene work was in progress, were divided among the regencies of that residency in which activities had been begun; the appropriations included in the budgets of these regencies; and regency units organized.

For example, the budget originally appropriated by the residency council of Kediri, was divided between the regency councils of

Toeloengagoeng and Blitar in which activities were already in progress. These two regency units are good examples of the work which can be done by a regency entirely at its own cost.

Although the funds for the units are usually supplied by Regency Councils or other local bodies, a few of the budgets have been supplied by the Province of Mid Java. It is hoped that these few budgets can soon be decentralized.

It is not expected that each regency appropriate a budget for a complete program of intensive hygiene work. A regency can begin with a small budget for one or two subjects of the program or with a small amount for the salary of one or two mantris. Several regencies have begun the work in this manner with small budgets which they gradually increase.

The Demonstration Regency Health Unit and Training Base at Poerwokerto (Banjoemas) which is financially supported by the Central Office of the Health Service, must be slowly developed into a complete program, so that Government authorities, doctors, and others can study the work there and decide which activities can best be used as a beginning in their own areas.

GENERAL SUPERVISION IN THE NETHERLANDS EAST INDIES

The detailed activities of an intensive hygiene unit are carried out by hygiene mantris, midwives, and other members of the subordinate personnel who report to an Indian Doctor. The Indian Doctor is responsible to a Regency Council, or to a Residency Doctor whose area includes several regencies. Residency Doctors in the outer islands are under the supervision of Regional Inspectors of the Public Health Service and Residency Doctors in Java are subordinate to the Directors of the Provincial Health Services of Java (East, West, and Mid Java).

PUBLIC HEALTH SERVICES IN GENERAL

The modern Public Health Service should be based upon activities for the prevention of the spreading of diseases and the prevention of diseases by means of measures which concern quarantine, isolation, education, et cetera; the stimulation of the people to improve the surroundings; the stimulation of the improvement of the health of the group and of the individual; and activities which stimulate in the people an interest in physical and mental hygiene.

After many years of experience, directors of public health services in many countries have realized that it is practically impossible to control endemic diseases by means of force alone. *The cooperation of the people is necessary and active cooperation is to be secured only through education until the public has understood the "why" of the measures proposed.* A public health service is therefore, in general, a large organization which theoretically and ideally stretches out to the boundaries of a country and reaches every person in it.

HEALTH UNITS IN OTHER COUNTRIES

In order to facilitate administration and give a better supervision of the activities of different Government services, authorities of most countries have decentralized as much as possible the activities of the various divisions of Government. Nearly all countries are therefore divided into small political divisions. The leaders of public health have also come to the conclusion that *for good administration and for better supervision of detailed work, decentralization is advisable.* It is of great importance that the financial and administrative responsibility for the details of hygiene work be placed upon local organizations.

THE ADVANTAGES OF SMALL HEALTH UNITS FOR THE NETHERLANDS EAST INDIES HEALTH SERVICE

The advantages of small health units are:

1. In the beginning of the work a general survey is organized for the study of local conditions and problems;
2. All activities concerning health work in the area are carried out under the direction and supervision of one leader;
3. One general program for the entire area is prepared and followed;
4. In accordance with the findings of the general survey, definite purposes are kept in mind;
5. The people of the area learn gradually that it is for their own good to adopt hygienic habits;
6. A local Health Unit creates much interest among the people, because the work is so intensive that they feel that they actually take part in the activities;
7. It is a form of decentralization of supervision and financial matters.

THE FOUNDATION OF HEALTH UNITS IN THE NETHERLANDS EAST INDIES

The principal political divisions of Java are the Province, the Residency (Division), and the Regency. Corresponding divisions in the other islands of the Netherlands East Indies have other names. From the beginning of the intensive hygiene work in the Netherlands East Indies in 1924 all activities connected therewith have been conducted with the idea of finally organizing small health services. *In the beginning it was decided to organize residency units, since a residency was at that time the smallest political division which had its own council and budget. Later on, when the residency councils were abolished and the regency councils were organized, the Regency was adopted as a much better Unit for local health services.*

THE NEED FOR THE ORGANIZATION OF THE DEMONSTRATION REGENCY HEALTH UNIT

Although the original plan of the work organized in 1925 called for the development of a general program of hygiene (see the first book on public health education, 1927), the programs of those in charge of field stations remained in most places concentrated on the prevention of soil and water pollution. In order to secure a further development of the program special personnel was employed by the Health Service and put at the disposal of the doctors in charge of the rural programs. Unfortunately this personnel was used to extend the areas of the campaigns against soil and water pollution instead of being used in developing the programs.

In order to obtain more uniformity in field activities and to stimulate development of programs, it was necessary for the Health Service to organize and develop a demonstration of a full health program.

In selecting a place for this Demonstration, it was necessary to choose a regency which is an average regency in area and population; one which is centrally located; situated on the main line of the railroad; easily reached by automobile; and fairly representative of the average economic conditions of the country. For these reasons and many others the Regency of Poerwokerto, Mid Java, was selected as the place in which the Demonstration will be carried out and the work was begun in April 1933.

At the Training Base at Poerwokerto visitors can study (a) the technic of the development of a general program of hygiene, and the training of personnel in the technique of the work.

It is necessary that a health service have a place somewhere within its territory where new materials and new methods can be studied and tested. The area of a Demonstration Regency Unit is the most suitable area for such a testing ground for the health service in the Netherlands East Indies. Through this testing and studying, improvement of both materials and methods is secured. Since the area of this demonstration regency service is the testing ground for the Health Service, it must be kept under direct supervision of the Central Office of the Service.

A TRAINING BASE

Real hygiene work claims the full energy and time of the personnel assigned to a program and when it is properly carried out, it is exceedingly difficult work. It requires of the workers not only an inexhaustible patience, but also a thorough knowledge of the technique of developing a program and of the technique of conducting the various activities. *In order to secure satisfactory results, good supervision of the lower personnel is necessary and this claims from the Director of the work a good knowledge of the details of the technique which should be used by the personnel.* Even a well trained hygiene-mantri will gradually fall into inefficient methods of working if he is supervised by a doctor who is not trained in the technique which should be used by the mantri.

Many doctors have been trained primarily for hospital and clinic work or private practice and are therefore inclined to place far too much emphasis upon the treatment of patients. The interest of such doctors is naturally centered on treatment work, so that treatment plays an important role in all the activities which they organize.

One of the other difficulties connected with health work in all countries is that so many do not realize that hygiene work, properly conducted, requires a special training. The result is that many activities conducted under the name of hygiene or health education are activities which in other areas or in other countries have already been tried out and proven to be of little value. It is a pity that persons who begin such work, do not first study the problem, and study methods used by others before beginning their work. Properly conducted hygiene work has a definite technique which must be learned

if permanent results are to be obtained. Most people think that hygiene work is very easy to conduct and that it can be carried on as an extra activity in connection with other programs.

THE GENERAL PROGRAM FOR A HEALTH UNIT

Whenever a small health service is to be organized in an area, one must begin by outlining one general program of activities for the personnel of that area and the personnel must realize that all activities lead to one definite object. Complete cooperation of all members of the personnel and good relationships have a great influence upon the work. Many difficulties will be avoided if, before the work is begun, the various activities and the methods of cooperation of the members of the personnel be definitely outlined in detail and discussed in general conferences.

The details of a program depend upon the local conditions, the available funds, the density of the population, the most important problems concerning the prevalent diseases and conditions, and the occurrence in the area of typhoid, dysentery, smallpox, plague, yaws, et cetera.

The purpose of the program for a small unit is:

- (a) the creation of hygienic habits and of an understanding of personal hygiene;
- (b) the improvement of the surroundings;
- (c) the reduction of the spreading of diseases and finally the prevention of diseases;
- (d) the improvement of the health of the people not only physically, but also mentally.

The activities must be begun with a general survey concerning the local conditions. By means of this survey the personnel has the opportunity to learn the geography and conditions of the area and become acquainted with the people. The activities begin usually with propaganda for the improvement of the conditions in the village. This is a type of work which cannot proceed rapidly. In order to secure good results the personnel must be very patient and must be satisfied in the beginning with small successes. For example, the habits of the people in regard to the pollution of soil and water can not be changed in a short time, because this means the giving up of age-old habits. This is only one example, and other activities progress often just as slowly.

PROGRAM FOR A REGENCY UNIT

1. GENERAL ADMINISTRATION: *Correspondence, reports, circulars, financial records and bookkeeping, preparation of schedules and programs for personnel, et cetera.*
2. GENERAL SURVEY: *In advance of extension of the area. General condition of homes and yards. Family census.*
3. STATISTICS: *The collection and study of birth, morbidity, and mortality statistics. The use of charts, graphs and pinmaps to show the activities, personnel, the data collected in surveys, reports, et cetera.*
4. EPIDEMIOLOGY: *Investigations, laboratory examinations and tests, et cetera.*
5. HEALTH EDUCATION: *By films, lectures, et cetera, but mainly by home visits, including activities for adults and children.*
6. ACTIVITIES FOR THE PREVENTION OF SOIL AND WATER POLLUTION.
7. INFANT, CHILD AND MATERNITY HYGIENE: *The hygiene of prenatal, labor and puerperal periods; and infant and preschool hygiene.*
8. SCHOOLWORK: *Inspections and improvement of school yards, latrines, wells, school buildings, furniture, et cetera; hygiene for teachers; courses of lectures for teachers; the securing of hygienic habits among the children; the weaving of the teaching of hygiene in the regular courses of the schools; the examination of the children physically; and the securing of the correction of physical defects.*
9. LABORATORY EXAMINATION AND TESTS.
10. DRINKING WATER: *The use of boiled water. The securing of good water supplies, et cetera.*
11. THE DISPOSAL OF GARBAGE AND REFUSE.
12. HOUSING.
13. HYGIENE OF FOODS AND FOOD SUPPLIERS: *The inspection and improvements of markets, restaurants, containers used by street sellers, et cetera, and the examination of food handlers.*

REACH THE INDIVIDUAL

It is the task of the personnel of a health unit to make every individual in the area realize that he and his family are to be reached by the activities of the program. If this realization has been secured, then the people will give full cooperation for the measures which may be proposed.

The work of a health unit must include activities for the individual in all the stages of his entire life:

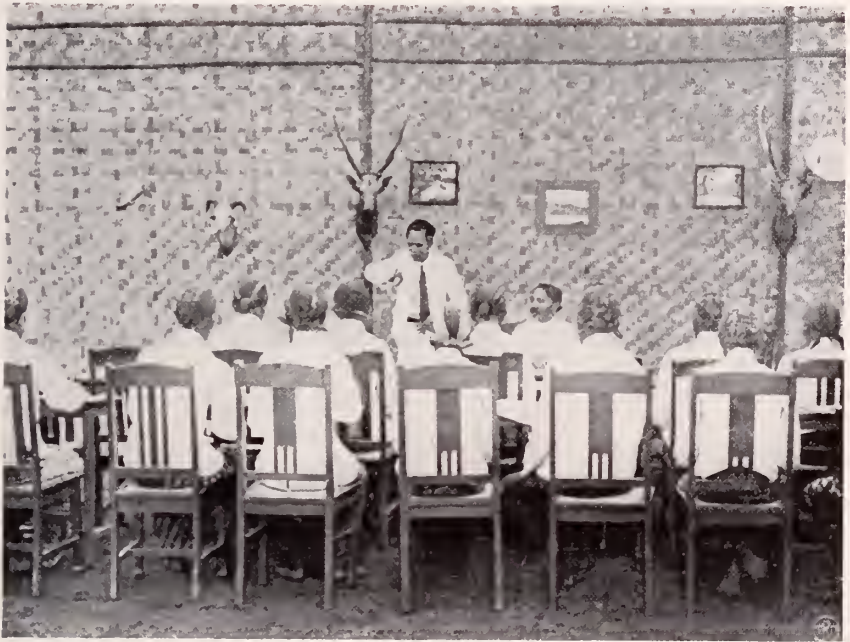
- A. Prenatal period.
- B. The birth.
- C. Infancy.
- D. Preschool age.
- E. School age:
 - (a) at school.
 - (b) at home.
- F. Youth.
- G. Adulthood.

In the beginning the work must be very intensive. Each member of the personnel is given a small area, usually a village of from 2,000 to 4,000 people. A hygiene-mantri begins the work in his village with one subject. When the work on this subject is well under way and results have been secured, a second subject may be added to the mantri's program. The second subject is usually easier to handle because the mantri has won the confidence of the people. Soon other subjects are added to the program for that village and then the mantri may extend his area. In this way extension takes place gradually and is based on results obtained.

The number of villages one mantri can handle will depend upon topography, roads, type of people, and many other factors. The work must first be directed to the individual in order to secure his cooperation. Later on, when the people understand the work and realize that it is being carried out for their own good, it can be expected that they will be more willing to come to centers so that the activities may be conducted on a less intensive scale. The home contact, however, must not be neglected, but the home visits will become less frequent.

EMPHASIS ON HYGIENE

Real hygiene work places emphasis upon hygienic habits and customs which tend to preserve the health of the people. Healthy infants must be brought regularly to hygiene centers for examination and for advice. These infants are examined regularly and their care discussed with the mothers in order to avoid incorrect feeding, undernourishment or unhygienic conditions which lower resistance, and to detect diseases as soon as the first symptoms appear. Adults and children are stimulated to adopt ordinary hygienic habits in the home.



The doctor gives lectures for the village officials

EMPHASIS UPON SIMPLICITY

The materials and methods which are now being used in hygiene work teach the people of rural areas simple hygienic habits and customs and teach them also to use the simplest and most inexpensive materials. For example, the people of the villages learn to build inexpensive or costless latrines; they learn to make costless toothbrushes and nailbrushes of cocoanut husk; they learn to make covers of bamboo which protect their food from flies; they learn to boil their drinking water; to wash their hands after defecation; to wash their hands before eating, et cetera.



Each house must be numbered during the general survey



Before hygiene work is begun in an area, a general survey should be carried out. This survey furnishes details concerning local conditions, topography, the people, medical history of the area, et cetera. A program can then be prepared.

It is one of the principles of hygiene work that it is better not to begin in an area unless the plans call for a permanent program. A temporary program for hygiene work is not worth while. Work in an area is never completed, and once the activities have been begun, the area must always remain under supervision. The work can be begun on a small scale and then gradually built up and extended.

It is always advisable to begin in a small area, for the experience gained there will be useful in planning the extension of the work.

On account of the fact that in a city the conditions are quite different from those in rural areas, many measures must be carried out by means of laws and regulations, but when the hygiene work is to be carried out in a rural area, then the use of force must not be tolerated, for permanent results can be secured in rural areas only through intensive hygiene work and health education.

In selecting an area in which to begin the work, the director of the unit should choose a place which he can easily reach, especially if he is obliged to carry on other activities in addition to the hygiene work. Often a piece of work has failed on account of the fact that it was placed at too great a distance from the headquarters of the doctor who had to supervise it. *Naturally much better results will be secured if the doctor who conducts the activities, is assigned exclusively to hygiene work and lives in the area in which the work is conducted. The doctor must not forget that he must check not only the details of the work, but also the technique of the personnel.*

It is, of course, of the greatest importance that hygiene-mantris, midwives and all subordinate personnel live in the area in which they work.

If success is desired, exclusively well trained personnel should be used. Failures in this work are also often caused by attempts to carry out hygiene work with improperly trained personnel. Well conducted hygiene work demands a special training in the organization of the work and in the technique of conducting the activities. This is true not only for the subordinate personnel, but also for the supervising doctor. Moreover, how could a doctor check his personnel

in regard to technique and details if he himself has not had the special training?

THE FIRST ACTIVITY

With which activity should the program be begun? The appointment of personnel will depend upon the available budget and the doctor must consider the local conditions and decide with which activity he will begin. He should avoid selecting an activity because it is attractive to him, and should be guided entirely by local conditions.

Also, he should avoid selecting an activity with the idea of leaving the details to subordinate personnel. A doctor should not begin with infant hygiene, because he thinks that this could be left to the midwife; or with latrine work because he thinks that the hygiene-mantris have been well trained and can be instructed to carry out this work without further supervision.

In organizing and developing hygiene work, especially when it is being begun on a small scale, the director must bring all activities in the direction of the organization of a health unit.

ACTIVITIES OF A SMALL HEALTH UNIT

OFFICE ADMINISTRATION

This includes financial records; bookkeeping; correspondence; circulars; reports; the preparation of maps and graphs; the study of statistics; the filing of birth and death certificates; the preparation of work-programs for personnel; et cetera.

SUPERVISION

The mantris, midwives, and other members of the subordinate personnel who carry out the detailed field work of a unit must live in the villages in which they work, and the supervision of this personnel is one of the most important activities of the director. In some places hygiene work has failed or has not secured good results, because the detail work of the subordinate personnel was not checked often enough. This is a great pity, because whenever the work in an area has failed and it is at a later date begun again, it is always much more difficult at the second attempt to secure the cooperation of the people. One can almost say that, if the subordinate personnel is to be left to follow its own initiative, it is better not to begin the work. Also, it is not quite fair to a local council to accept money

for personnel and use for this work untrained persons or put them to work without proper supervision.

Each mantri, midwife, or other worker has at his house in the village or at the house of the village head, a sketch map of the village showing every house with its number, the roads and paths, rivers, etc. Each morning and each afternoon a small paper flag with the date and "A.M." or "P.M." is placed on the map in the area of the village where the person plans to work so he can be easily found by the doctor if he visits that village for inspection or checking.

At each house the mantri has a small card which is fastened to the doorpost or somewhere in the front gallery of the house. On this card he notes the date of his last visit and the subject or subjects discussed and the number of the members of the family who understand the subject. This gives the doctor an opportunity to check the mantri's work at any house even if he can not find the mantri.

HEALTH EDUCATION IN THE PROGRAM OF A UNIT

Public health education is always one of the most important activities of a program. The cooperation of the people must be obtained through education by which the success of other activities will be secured. Health education is divided as follows:

1. General propaganda, which includes the creation of interest through the showing of films, lantern slides, etc.; and the giving of lectures, demonstrations, etc.; and
2. Intensive hygiene work through personal contacts by means of house visits.

This intensive hygiene work is difficult, but it is the best method of securing permanent results. In other countries many pamphlets, leaflets and printed materials are used for health education, but in the Netherlands East Indies, where more than 65% of the rural native population are illiterate, other methods must be used. Experience has shown that the best method is the house visit.

HYGIENE CENTER

The hygiene center is the place where pregnant women may come for advice concerning the antepartum period and advice concerning the birth of the baby. Also, healthy infants are brought regularly by their mothers to these centers to be measured, weighed and examined by the midwife or by the doctor.

Public Health Service
Regency Health Unit of: _____

General Survey

District _____ Subdistrict _____ Village _____ Date _____ 19 _____

House No _____ Tenant _____ Occupation _____ Owner _____

I House	II Yard	III Stalls for Domestic Animals	IV Latrine	V Water
House used as: _____ dwelling _____ shop	Yard used as: _____ garden _____	Horse stall: _____ good _____ fair _____ bad	_____ No latrine Pollution of _____ the yard _____ the river _____ pollution of drains _____ other	Drinking Water _____ piped water _____ spring _____ well _____ river _____ pond _____ rainwater
Number of Occupants _____ Number of Rooms _____ General Condition _____ good _____ fair _____ bad	Depth of subsoilwater ± _____ Meter General Situation _____ sloping _____ level _____ high _____ low	Made of: _____ bamboo _____ wood _____ stones	_____ Latrine completed Date latrine completed _____	Piped Water _____ public _____ private _____ capped spring _____ open spring _____ treated river water
Position: _____ stands alone _____ one of a row _____ part of a barrack _____ storied	Soil: _____ sand _____ clay _____ marl _____ lime _____ loam	Floor made of: _____ stones _____ boards _____ earth _____ cement	Distance of the latrine from the House _____ meters Well _____ meters Latrine used for: _____ one house _____ more than one house	Well: _____ Public If well is for more than one house house Nos _____
Walls: _____ bamboo _____ brick _____ riverstones _____ clay _____ boards _____ palm-leaves	General Condition _____ good _____ fair _____ bad	Cattle shed _____ good _____ fair _____ bad	If latrine used for more than one house, house Nos _____ Kind of latrine _____ Pit _____ Bored _____ W.C. _____ Bucket _____ Surface latrine _____ Other type	Well: _____ private Distance of well from latrine _____ meter Depth of well _____ meter
Frame: _____ bamboo _____ wood	Trees: _____ mango _____ jackfruit _____ cocoanut	Made of: _____ bamboo _____ wood _____ stones	Latrine-pit Depth _____ meter Latrine Pit: _____ large _____ small _____ round _____ square	Depth of well _____ meter _____ dug well _____ drilled well _____ closed well _____ open well _____ walled above with _____
Roof covering: _____ tiles _____ palm-leaves _____ palm-fibre _____ tin _____ corrugated iron _____ boards _____ bamboo	Plants _____ cassava _____ maize _____ banana	Floor made of: _____ cement _____ boards _____ earth _____ stones	Lining of the pit: _____ no lining _____ bamboo _____ brick _____ river stones	Well lined with _____ bamboo _____ stones _____ no lining
Floor: _____ tiles _____ stones _____ earth	Drainage _____ subsoil _____ surface-closed _____ surface-open _____ stone-lining _____ cement-lining	Pigsty: _____ good _____ fair _____ bad	Floor of the latrine: _____ cement _____ brick _____ riverstones _____ boards _____ bamboo	
Lighting: _____ good _____ medium _____ insufficient _____ dark	Condition of Drainage _____ good _____ fair _____ bad	Made of: _____ bamboo _____ wood	Superstructure: _____ bamboo _____ brick _____ boards	
Ventilation _____ good _____ fair _____ bad	Refuse _____ pit _____ burned _____ thrown in river	Floor made of: _____ cement _____ boards _____ earth _____ stones	Condition of latrine: _____ good _____ fair _____ bad	
	Garbage: _____ garbage can _____ no disposal	Poultry coop: _____ good _____ fair _____ bad	Flies: _____ not flyproof _____ flyproof	
	Mosquitos breeding in: _____ open drains _____ fish pond _____ pools _____ river _____ cocoanut-shells	Disposal of manure Stalls Sheds & Coops _____	Use of latrine: _____ good _____ fair _____ not used	
	Fly-breeding in: _____ faeces _____ manure _____ refuse		Contents: _____ small amount _____ half full _____ full	

Data concerning Family

No	Name		Population Group		Religion		Occupation		Education		Time resident in this House Village				Malaria		Memo	Notes		
	Male	Female									Year	Place	Year	Place	Year	Place	glo-	bin		

Data concerning deceased members of the Family			Health-Score									
No	Name	Relationship	Cause of Death	Mele	Female	Age at death	Abortions of living members of Family				Max-imum	This house
							No of bir-ths _____ No of abort-ions _____ No of premature bir-ths of living in-fants _____ at months _____ No of premature still born in-fants _____ at months _____ No of fam-ily now preg-nant _____				La-trine _____ Drink-ing Water _____ House _____ Gen-eral clean-ness of house and yard _____ No flies _____ No mos-gui-to _____ _____ _____ _____ Total _____ 100	

It has been found that for such hygiene centers it is best to rent a small village house which is not on the main road. The house must be of the simplest sort, but at the same time one which can be kept clean. In most of the villages an ordinary bamboo house is used, because the visitors would not feel at home in a brick house or one of very expensive construction. It is inadvisable to place a hygiene center in a hospital or in a building which is used also for a clinic or a dispensary.

At these centers, drugs and milk are not used to attract numbers, but patients are referred to clinics for these things, because those who visit the centers must learn that the reward for attending the center is the opportunity to learn more about health and hygiene.

The pregnant women, the infants or the preschool children, who come to these centers, are registered on special cards and forms. At the first visit special data are recorded and at each revisit the date and special notes are entered.

At the Hygiene Center the midwife gives demonstrations for mothers and expectant mothers. On one day the midwife will demonstrate how a baby should be bathed with warm water and soap, and on the next center-day one of the mothers who has attended the previous demonstration, will give this demonstration with the help of the midwife. This is only a method of securing active interest among the mothers. From time to time other demonstrations are given, at one time how the baby clothes should be made; at another time how the soy bean milk is made; et cetera.

On the day upon which the Center is open, the hygiene-mantri of the village in which the center is situated, helps the midwife with the registration of the visitors, with the weighing, measuring, etc. In this way the village women come in contact again with the hygiene-mantri, and also the activities of the hygiene-mantri and those of the midwife are combined. This is a sample of the interlacing of activities.

THE MIDWIFE AND THE "DOEKOEN-BERANAK"

"Doekoen" is the word which is used in the Netherlands East Indies for an untrained person who practices medicine—a sort of "medicine man." There are also other "doekoens". For example, those who care for babies are called "doekoen baiji" and those who help at deliveries are called "doekoen beranak".

At the Hygiene Center the midwife gives demonstrations in

hygiene for the "doekoens—beranak". The "doekoens-beranak", found in all villages in the Netherlands East Indies, are the untrained midwives. They are people who have, from time to time, assisted women in labor and without any further training, become known as "doekoens-beranak". Although these women have never had any training in obstetrics or in hygiene, they are fully trusted by the village people, so that it is not to be expected that the people will soon change their habits in regard to calling the doekoens to help with the deliveries. The population of the Netherlands East Indies is large, and the people of the villages have been accustomed for centuries to use the help of the doekoens, and do not willingly call in a doctor or a midwife. It is not to be expected that in the near future enough well trained midwives can be placed in rural areas or that the people will change their habits concerning the doekoens. It is also a question for discussion as to how far a health service should go in supplying free obstetrical service for a people. The Health Service plans, however, to supply more and more well trained midwives who will go into rural areas and take up private practice. *To help the people temporarily and to bridge this period, the Service uses these hygiene-centers and the services of the midwives who are in charge of the centers to teach these doekoens the elements of hygiene.*

There is no training in obstetrics, but the doekoens are trained in the simple hygienic measures which they themselves can carry out. They learn to wash their hands properly, to clean their nails, to care for the cord properly, to boil all instruments used, to wash the baby properly, etc. Most of the deliveries in the villages are normal, so that for the present the doekoens are allowed to care for the mother and child as long as the birth is normal. As soon as they see that the labor is abnormal or too lengthy, then the doekoens must call the midwife or the doctor.

In other words, since the Health Service cannot supply enough well trained midwives for the present period, the custom of the people will be used temporarily to help. During this temporary period efforts will be made to make clear to the village people that the doekoen, who has followed a course in hygiene, secures better results and makes the woman feel more comfortable during delivery than the doekoen who has not had training in hygiene. They also see that the midwife is much better than the doekoen. It is hoped then that gradually the demand for well trained midwives will be greater and that the number of doekoens will gradually decrease.

Through the training of these doekoens in hygiene, the Service makes this transition period safer for the village mothers. Not only do the doekoens learn to work in a more hygienic manner, but they gradually learn that many of the things which they have done because of superstitions are really not necessary and that the woman who is in labor is much more comfortable if she is taken care of according to more modern methods.

The midwife begins her activities in an area by visiting the doekoens of the village. She becomes acquainted with them and makes them understand that she is not there as a competitor, but has actually come to help them in their work. She emphasizes the fact that she herself may not have private practice and may receive no fees of any sort.

It is quite clear that for successful work the midwife must be forbidden to have private practice or to receive fees of any sort. Not only is this necessary to secure the cooperation of the doekoens, but the midwife needs her full time and energy for the activities of the hygiene-centers and the propaganda in the villages. Furthermore she must also be present at the hours in which the hygiene-center is open to the public, whereas, if she were in private practice, she would often be called away during the hours of the center.

The midwife gives in each area, once per week, a demonstration for the doekoens of that area. This demonstration is not given in the form of a lecture, but an actual demonstration in which at each gathering one of the doekoens actually goes through with the details of caring for a delivery and for the baby. *Since the doekoens are practically always illiterate, this is the only way to train them properly. The actual details of the work must be gone through with so often that the details become automatic.* For example, a table with instruments and all necessary clothes is prepared; the instruments, whether they be of steel or of bamboo, are actually boiled; the hands are washed with soap and warm water and scrubbed with a brush; the cord of a special doll is actually tied and cut; the doll is washed with warm water, and then dressed; the placenta is cared for properly; and the mother is actually bathed. During this demonstration one of the doekoens or one of the helpers at the center acts as the mother.

It is of the greatest importance that these demonstrations be held for small groups of doekoens. If there are too many present, they become shy and are not willing to go through with the demonstration

in which they are subjected to the criticism of the other doekoens. If the group is small, the demonstration takes place in a friendly spirit, there is criticism of each other and the midwife becomes the real friend of the doekoens.

It has also been found that these demonstrations which require much patience must be given by a midwife and not by a doctor.

After the midwife has given several demonstrations to the doekoens, she requests them to let her know when they expect to have deliveries; to give her the addresses and the dates; and whenever they know that the labor has begun, to warn her, so that, if possible, she can attend. From time to time she inspects the deliveries to see if the doekoens follow the methods which they have learned at the demonstrations. *She is, of course, very careful never to make any criticism in the presence of the family which has called the doekoen,* but notes down any mistakes which she will discuss later with the doekoen at the next gathering.

The midwives must also be very carefully trained for this work, for through the cooperation of the midwife and the doekoens it is possible to get the pregnant women to come to the hygiene-centers for examination early in their pregnancy and regularly until the delivery. This is very important. Since the doekoens know that the midwife is not a competitor, they bring their own patients and the new born babies to the centers.

If the midwife conducts the activities of the hygiene-center properly, carries out a certain amount of educational work in the villages, gives the demonstrations for the doekoens, and now and then checks a delivery given by a doekoen, she will not have time for private practice.

HYGIENE WORK IN THE SCHOOLS

Hygiene work in the schools is very important, but the details of the school work should be based upon the fact that *school work alone secures very unsatisfactory results because the child still remains under the influence of its parents. Activities in the school should be combined with intensive work in the village so that child and parent receive training in hygiene at the same time.*

Since few doctors have a talent for teaching, and most of the doctors have no training in teaching children, it is better that the details of school hygiene work be carried out by the teachers. The details of teaching the children must be left to the school teacher,

but the doctor in charge of a health unit must give courses in hygiene for the teachers of his area.

It is hoped that the Department of Education will arrange to have courses in hygiene given in all normal schools and other schools for the training of teachers, so that this activity of the doctors can later be dropped from the program except for occasional review courses.

There is, of course, no objection that the doctor or the hygiene-mantri give an occasional lecture or demonstration at the schools in order to stimulate further interest of teacher and children.

The doctor of the unit begins his school work with the inspection of the building and the grounds. On a special printed form he notes the general condition of the grounds, the presence of breeding places of mosquitoes and flies, etc.; the distance between the latrine and well; the quality of the drinking water; condition of the latrine; cleanliness of the yard, et cetera.

In the building itself he makes notes concerning general upkeep, size of the rooms, lighting, ventilation, cleanliness, furniture and other equipment, et cetera.

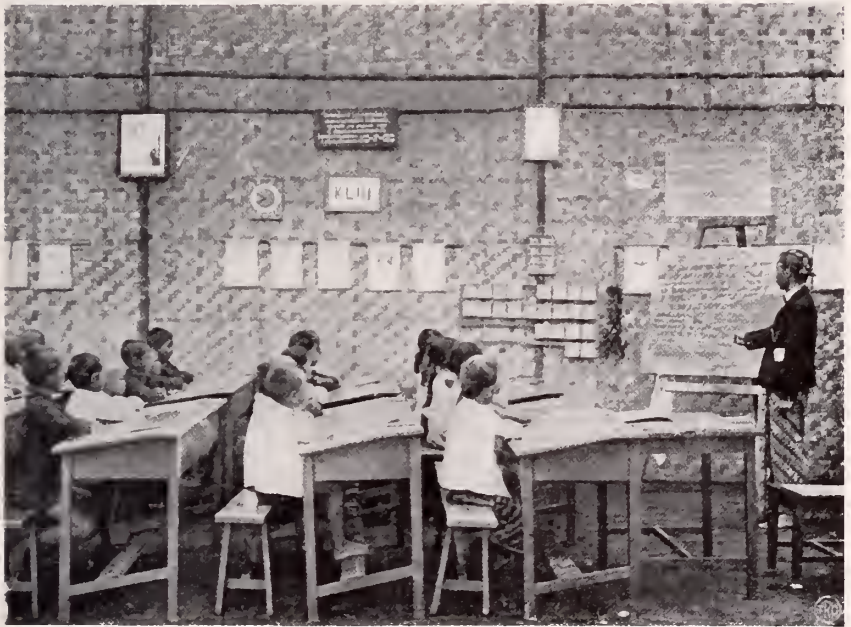
After the building and grounds have been inspected, the doctor begins with the examination of the teachers and the children. At the first visit he usually notes only conditions concerning general condition; a few further details are noted at the second visit; and only after several visits is the examination completed. In this way the children gradually become accustomed to physical examination and give their full cooperation.

If during his examination the doctor finds a child with a physical defect or a disease, he fills in a printed form and tells the child to take this to his parents who will take him to a dispensary or to a doctor. *At the same time the hygiene-mantri of the village where this child lives is notified concerning the case, so that he can visit this family and explain the need for medical care.* The hygiene-mantri will also follow this case to see if the child has actually secured treatment and by the visit to the family can also see if there are others in the family who have the same disease. If so, they are also advised to go to the dispensary for treatment. At this visit the hygiene-mantri can also advise other members of the family concerning what they should do to avoid having the same disease.

By means of physical examination of teachers and children it is planned:



The doctor examines the schoolchildren



A lesson in hygiene for the third grade



Medical examination of schoolchildren



The hygiene-mantris make follow-up visits to the homes. The little girl has conjunctivitis and her parents must take her to a dispensary for treatment

1. To search for and record the diseases, conditions, and physical defects which in the Netherlands East Indies hinder the physical and mental development of school children, and to collect statistical data concerning these points for study and for planning activities of the program; to collect data which can be used later for comparison and for determination of results obtained;
2. To give each teacher and child a physical examination;
3. To send teachers and children to doctors and dispensaries for treatment of diseases and conditions, and for correction of physical defects;
4. To control through follow-up work treatments and correction of physical defects given to those sent to physicians and clinics.
5. To relieve, and as far as possible to prevent, diseases and conditions which are harmful to the physical and mental development of the school children.

School work should be carried out in connection with village work in order that the parents will support the children in carrying out at home what they have learned at school. Hygiene work must reach the child at home as well as at school and must be practical. School work is based on the idea that success lies not in having the child learn facts about hygiene, but in having him learn hygienic habits.

Especially in the lower classes must the emphasis be placed not upon learning the theory of hygiene, but upon the creation of hygienic habits. The habits proposed for the village school children must naturally be very simple. Also it is of great importance that *the children not be asked to form habits which they will not be able to follow at home.*

The forms which the children must use to record their habits are arranged so that there is a column for each day. The first part of the form concerns the cleanliness of the teeth, hands, and nails of the child upon his arrival at school each day. Each child must inspect his desk mate in regard to these points and fill in his form for him. This creates, of course, extra interest in the reports.

The rest of the form concerns the hygienic habits which have been carried out during the previous day at home. This part is filled in by each child for his own habits and concerns washing his hands, cleaning himself after defecation, the use of a latrine, pollution of soil or water, etc. At the end of the month these forms are

collected by the teacher and given to the hygiene-mantri who works in the village. The mantri then selects a few of these forms, visits the homes of these pupils, and finds out if the points entered on the forms have actually been carried out at home.

One of the important points concerning this work in the school is that there is no reward for following the hygienic habits and also no punishment if the habits are not followed. The result is that the children fill in their forms accurately. There is a definite attempt to teach the children that the reward for following these hygienic habits is their own good health.

During school hours the children are taught by the teacher how to wash their hands properly with soap and water. They are also taught to make tooth brushes and nail brushes of cocoanut husk and to make covers of bamboo for food. The most important point about this is that the children learn to do something for themselves.

The cooperation of the school teachers, the parents, the doctors, the hygiene-mantris, the midwives, and all members of the personnel of the Health Unit is necessary to secure the proper carrying out of the hygienic habits, and also to secure proper treatment or the correction of physical defects for the children who have been sent to clinics or hospitals.

"The school, if properly administered, should look after the child's health while in school, but *school training is inadequate unless the home cooperates with the school.* The evidence is overwhelming that children do not form their health habits easily."—by ANDRESS and BRAGG.

"The primary seat of health training is, of course, in the home, but the public schools should support the home in this task."—by TURNER and COLLINS.

"The success of a school health program necessarily depends on the cooperation of the homes, where most of the health habits in which the school is interested must be put into practice."—by A. M. PHELAN.

From "A School Health Program as an Educational Activity" by D. W. Gudakunst, in the "American Journal of Public Health" April 1935:

"Having detected a child ill with symptoms of a communicable disease, but part of the task is done. The fault that lies back of this child's coming to school, endangering his own and the health of others, must be corrected. That can be done only in the home."

"A school health program conducted as an isolated bit of effort is doomed to failure."

MEDICAL TREATMENT IN THE SCHOOLS

Many think that medical treatment of teachers and children in the school helps the hygiene work. In the beginning of the hygiene work in the Netherlands East Indies a small amount of treatment was given in connection with the work in the school. However, experience has shown that this is not advisable. The plan was that treatment should be used only in the beginning in order to secure the cooperation of teacher and children, but that it should be stopped as soon as possible. Unfortunately it was found that many of those in charge of school work instead of reducing the number of treatments, actually extended the work on the basis of treatments, so that they almost turned the schools into dispensaries. The result was that the organization of proper dispensaries for general medical work was postponed in those areas; the real school work was disturbed by the giving of treatments in school hours; and the real hygiene work was not carried out, because too much time was given to treatment work. When one begins with treatment, it is always difficult to stop it.

There is, of course, no objection to placing first aid kits in schools provided these kits are not turned into medicine chests. If a medicine chest is supplied to a school, the teachers must be taught to use the medicines, and one can not expect efficient use of drugs under such circumstances. It is also difficult to know if the medicines are used for school children alone.

Furthermore, one of the important principles of hygiene work is to teach the people to do as much as they can for themselves. For this reason it is better that the children not be treated at school, but that the parents bring them or send them to the dispensaries or to the hospitals for treatment.

HYGIENE WOVEN INTO THE SCHOOL PROGRAM

Hygiene can be woven into the ordinary plan of instruction of the school in many different ways. For example, a teacher can give a lesson concerning the pronunciation of Javanese, but so arrange the lesson that it concerns some subject of hygiene. In many other ways this system, which has been so well developed in the schools of Malden and Newton in Massachusetts, can be applied in any country.

In cooperation with the authors, hygiene is being brought into the text books which are used in the schools. Through the use of words in the books for the lower grades, sentences in those for the next grades, and full articles for those in the higher grades, various subjects concerning health and hygiene appear in many places in the ordinary text books.

However, school hygiene work must not be overestimated in regard to the results which it secures in rural areas. The child is under the influence of the teacher only during a few hours of the day while during the larger part of the day he is under the influence of his parents and the other village children. In the small village schools of the rural areas the children are usually at school only from 7 to 12. In some of the small villages, boys are at school between 7 to 9 and the girls between 9 to 11.

TOOTHBRUSHES AND NAILBRUSHES

The Director of the Poerwokerto Health Unit (Dr. Soemedi) devised a method of making very simple toothbrushes of cocoanut husk. A small piece of cocoanut husk about 10 cm. long and about 1½ cm. thick is shaped to a point at one end; for a distance of about 1.2 cm., the outer hard part is cut away and the fibers of the stub pounded loose with a stone or scraped free with some sharp instrument. These fibres at the end of the stick form a sort of toothbrush.

After having used brushes of this sort for a time, the school-children themselves devised an improved model by using a bamboo handle and inserting a plug of fiber made of cocoanut husk.

The children have also been taught to make nailbrushes of cocoanut husk.

Some do not approve teaching the people to brush their teeth. They claim that the brushing damages the enamel of the teeth and that since brushing and taking care of the teeth do not prevent decay, it is not worth while. Experiments show that reasonable brushing of the teeth with an ordinary toothbrush and toothpaste or simple substitute does not injure the enamel of the teeth. Fortunately brushing does lessen the amount of tartar formed on the teeth.

Brushing the teeth may not prevent decay, but it removes the small particles of food which ferment in the mouth and gives the person "a mouth that feels clean". If the teeth are covered with the usual bacterial growth and fermenting food particles lie along the gums, the mouth does not feel clean.

One could also get along with less bathing of the body, less washing of the hands, feet, and face, but the feel of a clean body, clean hands, and clean face is well worth while and is certainly more hygienic.

STATISTICS

Morbidity and mortality statistics must be collected and studied. Accurate morbidity statistics are very difficult to obtain and for the present are collected only from reports of hospitals and polyclinics and from similar sources.

The general survey which precedes the activities of a unit, supplies data concerning houses, yards, and the members of the families in the surveyed areas.

As soon as possible, graphs are made of the collected data. This work progresses slowly. The first stage concerns the collection and tabulation of numbers,—the number of house-visits that are made; the number of latrines built; the number of visits to a hygiene-center; etc. The second stage concerns percentages,—the percentage of the houses furnished with satisfactory latrines, or the percentage of latrines that are well used, etc. The third stage is that in which the data are used to prepare graphs according to modern requirements with the use of the probable error factor and with the use of logarithmic tables and logarithmic paper.

REGISTRATION OF BIRTHS

For the calculation of many percentages it is necessary to have an accurate registration and reporting of births in the villages. This registration and report system is one of the most important activities of a health unit. Special forms are used for this work. Each village head keeps two sorts of forms; a book of pink forms for girls, and a book of blue forms for boys. The birth certificate consists of three parts: the stub which remains in the book; a middle section which is sent by the village head to the office of the regency health unit or, in case there is no health unit, to the office of the residency doctor; and a large section which is given to the parents of the child.

On the certificate there are places for: the names of the mother, the father, and the child, and the date and the place of birth. When a baby is born the birth is reported to the village-head who writes out a certificate. When the child is brought for vaccination, the vaccinator places the thumb print of the child in the section marked "1" of the birth certificate. In some regencies this thumb print is

placed upon the certificate not by the vaccinator, but by the village head. There is also a place on the certificate for a second thumb print when the possessor of the certificate changes his name or is married.

The back of the birth certificate is reserved for recording immunizations and there are special columns for vaccination against small-pox, typhoid, dysentery, plague, et cetera.

Arrangements have also been made for supplying a duplicate birth certificate in case of loss of the original, but the duplicate which is of a different color, is more difficult for the people to obtain, since the loss of the original must be verified and the identity of the person proven.

Each book of certificates contains instructions in Netherlands, Malay and Javanese concerning the recording of births and the supplying of certificates. These instructions include details concerning the color of the certificate, the serial number, the use of the three sections, the supplying of duplicates, the recording of immunizations, and the special instruction that the child must be registered in the village in which it was born regardless of the mother's address. Also in these instructions emphasis is placed upon the fact that a birth certificate must be issued for a child even if it has died a short time after birth. In this case the certificate need not bear the name of the child, but should have the names of the parents.

REGISTRATION OF DEATHS

The registration of deaths is also of great importance. The death certificates are also issued by the village heads and consist of two sections: the stub and the section which, after being properly filled in, is sent in by the village head to the office of the regency health unit or to that of the residency doctor.

In the present stage of the work the most important point is to secure an accurate registration of deaths with details concerning the name, age, sex, etc., of the person. The cause of death is not accurately reported, since in the rural areas so many people die without having had medical care.

There are also detailed instructions concerning the use of the death certificates. These details concern the use of serial numbers; the mailing of the certificate to the health unit office; and the fact that if the deceased was born after the adoption of the birth certifi-

cate system, the birth certificate must be attached to the death certificate when it is sent in. The village heads are also instructed to send in death certificates for stillborn babies, but to report only the names of the father and the mother. The instructions also include points by which a stillbirth is distinguished from an abortion.

LABORATORY EXAMINATIONS

At each Hygiene Center the midwife has a small laboratory set with which she can make routine examinations of urine. Specimens of feces, blood, and other preparations are sent to the Central Office of the Health Unit where they are examined by a laboratory technician in a laboratory especially equipped to carry out examinations for the entire unit.

PERSONNEL

For each member of the personnel a general program must be prepared and in addition a detailed program for each month or for each week. The director of the unit should know of the important details of the various work-programs. In preparing the detailed programs for the personnel consideration must be given to seasons, rains, etc. Latrine construction, for example, is always best carried out during the dry months.

The personnel consists of:

- I. A director. The director should be a doctor who has had special training in hygiene work. The director of a health unit is not only responsible for the direction and general supervision of the personnel, but must also keep in touch with all details of the work, and change the work-programs of the members of the personnel in accordance with the reports made to him and with changes in circumstances and conditions. The director is, of course, in every way responsible for the success of the hygiene work in his area. *He must give his entire time to the work and have no other medical work and especially no private practice.* He should have the qualities of a leader. He must be able to secure the confidence and the cooperation of his personnel, of the people of his resort, of the administrative Government officers, of the other doctors of the health service, of the local practising physicians, of the school teachers, and of many others. He must be active and energetic and have initiative.

- II. Clerks. One or more clerks in accordance with the size of the unit for correspondence, reports, supervision of materials, for bookkeeping, statistics, tables, graphs, etc.
- III. Hygiene-mantris especially for house visits, latrine work, general health education, and for lectures and demonstrations.
- IV. A laboratory technician at a large unit for the examination of urine, feces, blood, bacteriological preparations, water samples, etc.
- V. Midwives for hygiene-centers; for antepartum, infant, and preschool hygiene; demonstrations for doekoens; health education visits in the villages.
- VI. Malaria mantris, in areas in which malaria occurs: to catch and classify mosquitoes and larvae; to search for mosquito breeding places; to make and examine blood preparations; to supervise small drainage works or the use of oil or the cleaning of ditches, etc., and for propaganda concerning malaria.

SELECTION AND TRAINING OF HYGIENE-MANTRIS

The qualifications which a hygiene-mantri should possess are of great importance, because it is the mantri who carries out the details of the work in the villages. He must be a person who inspires confidence. If he is too young, the people will not have confidence in him and on the other hand, if he is too old, he will not only find it difficult to learn and in his turn teach the many new thoughts and ideas which his work will involve, but he will also very probably find that the village work is too tiring for his physical strength.

The mantri must be polite and modest and no circumstances will excuse rudeness or misuse of authority, yet if he is too shy, he will not inspire confidence. He must possess an inexhaustible patience, because he will be obliged to talk daily to many people about things which they do not understand.

A monotonous voice practically disqualifies an applicant. The mantri must make many visits during the entire day and the tone of his voice must express the fact that he is interested in his work and that he himself believes what he is trying to teach the people. Parrot-like repetitions of a series of sentences or the use of a number of half understood terms and phrases would only waste time and cause confusion. The required qualifications must be further devel-

oped during the period of training of the mantri and efforts for improvement of his technique must never cease.

In the area to which he is assigned after he has completed his training, the mantri receives further special training in regard to local conditions and customs, and the activities of the program. This additional training is given by the doctor in charge of the area who must exercise great patience in further developing the abilities of his personnel. *If the doctor is lucky enough to inspire in his mantris interest in their work, he can feel that he is well along the road to success, but he must always be on his guard to hold their interest and to find ways of stimulating it from time to time.*

Good results are to be expected only if the mantris have had a thorough training in the technique of making house visits. The technique of making house visits is of the greatest importance. Although this work appears to be easy, it is very difficult.

The manner in which the mantri approaches the house and calls to the people to see if anyone is at home; the way in which he enters the house and finally gets all the members of the family together; his method of leading the conversation; where he sits; his manner of talking; his skill in keeping the interest of all members of the family; his patience; his answers to questions which are asked; his ability to make the people talk, etc., are all points of the technique for which a long and thorough training is necessary.

The mantris must be told repeatedly that they must be accurate in regard to what they tell the people, and that they must avoid the use of high sounding words or technical terms. They should also be made to understand that a house-visit has been well made if they have succeeded in making the members of the family understand the subject well enough to ask questions about it. It can clearly be seen in certain areas that well trained mantris who have interest in their work obtain the best results and can secure the cooperation of the people.

Since the mantri must so often discuss the same subjects,—sometimes with people who show no interest at all, *he is liable at times to become a little discouraged and is then tempted to try threats of force. But methods of coercion must be strictly forbidden and the mantris brought to realize that permanent results can not be secured by such methods.*

These hygiene-mantris who conduct the activities in the village must be well selected, because their work requires them to deal

with people of different ages, from the youngest to the oldest, and people of all different types and characters. *This means that they must have a talent for speaking with people and an ability to convince them of the truth of what they say.* It is possible, of course, to train a laboratory mantri so thoroughly in the technique of examinations with the microscope or in the technique of laboratory tests that his actions become automatic. *The hygiene-mantri who carries out his task in the village must not work automatically, but with an understanding of the people with whom he must talk. He must know their habits and customs and must know when he should talk and when he should allow them to talk.*

One would not dare to place an untrained nurse in a hospital or to place an untrained person at work in a laboratory. If efficient work is desired, untrained persons must not be appointed to carry on hygiene work.

WEEKLY CONFERENCE

All the mantris of an area meet at the local office once each week to submit reports of their work and get instructions for the next week's work. At this meeting the doctor gives them a lecture or demonstration and a short oral examination on previous lectures. Then each mantri is given an opportunity to speak of any special difficulties he has encountered in his work and to receive from the doctor and the other mantris suggestions concerning the best ways of overcoming these difficulties.

The most important feature of the weekly meeting is the "test house-visit". One of the mantris is appointed to give a "house-visit" just as he is accustomed to give it in the villages in which he works. Some of the other mantris represent the members of the family which he is visiting and, of course, ask him as many difficult questions as they can. The method tests his patience and his ability to answer questions concerning the subject he is trying to teach the people. Other mantris listen to the conversation, watch closely the technique, and after the test visit is over, make criticisms. The doctor must discuss these criticisms and give helpful suggestions.

TRAINED NURSES AS HYGIENE VISITORS

In 1924, when the general survey was begun, intensive health education was carried out for a very short time in a few villages to study the reaction of the people and to secure their cooperation during the survey. For this purpose hospital trained nurses were

used for the educational work. It was thought at that time that the hospital trained nurse would be the proper person for this work and that this training in regard to diseases would form a good basis for further training in hygiene.

These trained nurses, however, were disappointing. They were unable or unwilling to learn the proper technique of the house-visit and remained on a far too high level for the work. The people felt at once that the nurse was of much higher rank and the nurse was unwilling to speak in simple language. They used large words and technical words which they had learned during their training in the hospital, so that the people could not understand their explanations. Also the house-visit took too much the form of a lecture to the people instead of a visit with general conversation. People do not like to be lectured or to be told too directly about their unhygienic habits. After a certain length of time it was quite clear that hospital trained nurses, in any case at that stage of development of the work, were not qualified to carry on the work.

However, from time to time, during the progress of the work, further attempts were made to use hospital trained nurses. It seemed a pity not to be able to use persons who had already had a certain amount of training which would give them a definite experience and background. The first difficulty concerned the securing of nurses. Work in the village was not attractive for them. The nurse who serves in a hospital has, in comparison to the hygiene-mantri in the village, very easy duties. The patients in a hospital, eat at the time set for them to eat; medicines are given at definite hours and the patients must take them; and the patient must, without argument, follow the instructions of the nurse. The nurses in the hospital conduct routine work; the conditions under which they live are pleasant; the conditions under which they work are pleasant; they enjoy good food and good quarters; and the life in the hospital is attractive.

The village work of the hygiene-mantri, on the other hand, is in many ways much more difficult. The hygiene-mantri must convince the village man that the advice which he gives him is good, and that it would be to his own advantage to follow it. The daily routine of going from house to house to talk about the same subjects and of answering all sorts of questions requires inexhaustible patience. The carrying out of the details of such work under such conditions is much more difficult than carrying out the routine duties of a nurse in a hospital.

It is therefore no wonder that the trained native nurses would not remain in hygiene work, but were always glad to take a position in a hospital or at a clinic.

For this reason it was finally decided to use the trained nurses only for microscopic and laboratory work, and for the intensive village activities to give special training to persons who had a talent for working among rural people. In the beginning of the hygiene work, when the program concerned only one subject, the training of these people, who were called propaganda mantris, was undertaken by the doctors in charge of the field stations. However, if the doctor did not have the aptitude for training personnel it became tedious work for him and this is one of the reasons why the hygiene programs of so many areas have not been properly developed, but have remained limited to one or two subjects.

THE HYGIENE MANTRI SCHOOL

When the Demonstration Regency Health Unit at Poerwokerto was organized, the director of the Unit trained the hygiene mantris which he needed for practical work in the villages. Once a week at the regular meeting of all personnel at the office the doctor gave a lecture in hygiene. Under these conditions the training of the mantris could not be extensive enough in regard to general hygiene. Although the training in practical work was good, the training in theory was not sufficient.

It was decided then to establish at Poerwokerto a school for the training of hygiene-mantris. This school must deliver well qualified and well trained hygiene-mantris for work in regencies or other areas where intensive hygiene work is to be organized.

The instruction is given in Malay in order to train mantris for work in all areas of the Netherlands Indies and the training is kept on a very simple basis. For example, the names of the organs and parts of the body, which usually occur in the ordinary conversation of village life, are used in teaching anatomy, physiology, etc., instead of technical terms, so that when the hygiene-mantris discuss various subjects at the house-visits, they will use words and terms which are well understood by the people. The lessons in all subjects are given on the same basis, for these mantris must not learn to think in technical terms, but in simple language.

As a rule a candidate who is admitted to the school must have a letter of assurance from a regency council or other organization

that he will be given a position as soon as he has completed his course of training.

The training is planned to equip the mantri for work in general hygiene in any area. For work concerning any special disease or condition, further detailed training can be given by the doctor in charge of the work in the area. For example, at a station where trachoma is the most prevalent disease, and the principal activities of the program are to concern the prevention of the spread of trachoma, the doctor in charge of that unit can give special instruction in regard to this disease.

The instruction at the school concerning diseases must not go too far in detail, but only be enough to prepare the mantri to explain accurately to the village people the causes and prevention of the most common diseases. *The hygiene-mantri must not be trained in regard to medical care or treatment, but should be trained to send the village people to clinics or hospitals where they will receive treatment. It is not necessary that the hygiene-mantri be able to diagnose diseases, for if during a house visit he sees or hears that a member of the family is sick, his duty is to send that person to the clinic or to the hospital or to secure medical care for him regardless of what disease he may have.*

Also it is far better that the mantris know nothing concerning treatment. Hospital trained nurses, who attempted to carry on hygiene work, very often gave medical advice or advice concerning medicines which should be bought and used. There was a tendency to try to practice medicine.

At the Hygiene Mantri School at Poerwokerto the training consists of a course of 18 months of which 9 months are devoted to practice and 9 months to theory. Each group of pupils begins with a period of 3 months practice (Practice I) in the villages, and then goes to the school for a three months course in Theory (Theory I). Practice course No. II consists of another 3 months in the villages and Theory II consists of 3 months at the school. The group then returns to the villages for Practice III and after that to the school for Theory III.

The course of study at the school includes lectures and demonstrations, practical work, and laboratory exercises. The elements of the following subjects are included in the program: anatomy; biology; embryology; physiology; bacteriology; parasitology; epidemiology; endemiology; infection; the most common diseases; the value

of medicines; misuse of medicines; (no instruction in therapeutics); the dispensaries, clinics, and hospitals; first aid; campaigns against endemic and epidemic diseases; prevention of diseases; transmission of diseases by insects and animals; hygiene and health including personal and mental hygiene, and the hygiene of house, yard, soil, water, and food; statistics; materials and methods used in hygiene work; various activities of a program; and the public health service as an organization.

Care is taken that the conditions under which the pupils study at school and receive their practical training in the villages are not too different from those of the ordinary village conditions. For example, during their stay at the school, the pupils must learn to boil their drinking water; make their own toothbrushes and nail-brushes; wash their own clothes; and plant vegetables in the garden.

In selecting a person who is to be trained for hygiene work it is important to give the candidate at once an opportunity to see and learn something of the practical rural work and to allow him to carry out some detailed work. This is the best way to ascertain whether or not the person has a talent for hygiene work in rural areas. Previous school training is not a determining factor.

Ability to carry on hygiene work successfully is an inborn gift which can not be taught. The candidate who has this inborn talent can be trained in technique and developed into a good worker, but the talent can not be trained into anyone. It has been found that if a candidate begins with practical work, his technique will be poor, but his abilities can be discerned in a short time. It is a mistake to begin the training with theory. Many can learn theory easily, but are poor at practice. Those who are good in practice can be taught the theory.

TRAINING OF MEDICAL PERSONNEL

Doctors of the Service who are to organize hygiene work can be given a certain amount of training at the Poerwokerto Health Unit, but for the future, the training of medical personnel should be more fundamental. The training should begin during the course at the medical school.

The Public Health Service in cooperation with the School of Medicine of Batavia, and the Koningin Wilhelmina Jubileum Stichting has organized a City Ward Unit in Batavia. This ward of the city has been given by the Municipal authorities to the professor of hy-

giene and bacteriology of the School of Medicine, who is the director of the Unit, to be administered by him and to be used for the training of the medical students in the subjects which concern public health and hygiene.

In organizing the program emphasis has been placed upon preliminary surveys; the collection of morbidity and mortality statistics; epidemiology; and the fundamental subjects of health work.

LATRINE WORK

The many difficulties which arise in connection with propaganda for new habits of life can be well illustrated by those encountered in conducting propaganda for the construction and use of latrines.

The very thought of using a latrine is so new and so absolutely contrary to age-old customs that it is difficult in the beginning for the people to believe that they have understood the suggestion correctly. In case someone in a village has been convinced of his need of a latrine, there still remains the problem of carrying out the actual construction of his latrine which is not made easy for him by the members of his community who think that such new ideas are absurd. After public opinion has partly been won over, there remain the questions involved in the manner of construction. The latrine must cost very little or nothing, but if possible should be durable, convenient and sanitary.

Therefore in the beginning of the work in an area the latrine consists of a simple deep hole in the ground covered with a strong bamboo frame which is in turn covered with a bamboo mat to shut out the light. The small hole in the center is kept closed by a piece of wood or woven bamboo which serves as a cover. This type costs the village man nothing. He digs the hole himself and cuts the necessary materials from bamboos and trees growing in his own yard. Later after he has learned to use a latrine, he is willing to spend something for better materials, but in the beginning it is absolutely necessary to consider cost of construction.

Usually this simple but sanitary latrine can be made of materials already in the yard of the village man's house, or if not in his own yard they are easy to secure at very little cost. The structure must not be too far from the dwelling and should be built in such a way that it is not washed away or blown down by every storm. However, in case a severe storm damages both dwelling and latrine, the mantri who is responsible for the area must convince the house-owner that the reconstruction of his latrine is almost as important as the recon-

struction of his dwelling. This is not so difficult if the house-owner has fully realized the need of his latrine. Often he repairs it of his own accord before the mantri makes his visit of inspection.

The upkeep of a latrine depends naturally upon the interest of those who use it and their understanding of its convenience and value, but with a little interest and care a simple latrine can be kept sanitary. Naturally in the beginning of such a campaign many insanitary structures will be built. But even though such an insanitary latrine may be a breeding place for flies, there were in the same yard, before the latrine was used, several spots of polluted soil which formed breeding places for flies, and not only has the house-owner actually begun to use a latrine and find it convenient and necessary, which means that he has broken his old habit of polluting soil and water, but also there remains the possibility of convincing him that he should give a little more care to the upkeep of his latrine, and keep it sanitary.

There are many villages in rural areas of Europe and the Americas in which the solidly constructed brick or board latrines are open at the back and are, therefore, breeding places for flies. Thus the problem in every country concerns the education of the people in regard to the proper use and upkeep of latrines. A simple pit latrine, with a bamboo upperstructure properly used and cared for, is more sanitary than an expensive brick or board latrine improperly used and not kept in good order.

Just as the village man understands that after a certain length of time his house must be repaired or rebuilt; that the roads must be repaired occasionally; that the tools with which he works must also be repaired from time to time; and that his clothes must also be repaired or renewed, so must he learn that a latrine is never permanent, but also must be kept in repair and occasionally rebuilt.

Cement covers for latrine pits are, of course, much more hygienic than those of bamboo or boards or other material, but in areas where money is scarce it cannot be expected that the people will pay for cement covers or build brick latrines. Also it is not advisable to supply free materials for the building of latrines or for making cement covers. The village man must learn that he must build his own latrine and supply his own materials. Experience has already shown that the people are willing to build latrines if they can be shown how this can be done without great cost. In several areas in Java the people have, on their own initiative, discovered various

materials such as soft limestone, a soft water deposit stone, and other materials from which simple but sanitary latrine covers can be made. These materials are used locally and can be dug out by each house-owner without any expense.

From time to time the question has been raised as to whether a latrine floor which is not made of cement or stone becomes a source of hookworm infection. The opening of the latrine pit is of course, not polluted each time that it is used; in case that it is polluted, it is nearly always cleaned again; the amount of fecal material is not great and is often washed away by the water which the person uses in cleaning himself after defecation.

Experiments in other countries have shown that even under the best conditions the mortality of hookworm eggs which have been deposited on the ground is great; that the mortality of the larvae which are developed from the surviving eggs is great; and that only few of the larvae which develop reach the infective stage. It seems, therefore, that the chance of infection from a latrine floor is more a question of theory and is not of such great practical importance. At any rate it is a point which should not be over-emphasized in the beginning of work against soil and water pollution. It is better that the people use these simple latrines which do not have cement floors, which are perhaps not entirely hygienic from all viewpoints and which allow perhaps a few hookworm larvae to remain in the ground near the latrine, but which prevent general pollution of the soil, than to allow the people to wait until they have money to build latrines with cement floors and in the meantime continue to pollute the soil in so many different places in their gardens.

It is more important that the people learn to use a latrine and thereby stop the general pollution of soil and water. Also the people must first learn to use a latrine and to keep it sanitary. After this habit has been thoroughly implanted, then the question of improvement of type and material can be taken up.

THE IMPORTANCE OF PUBLIC HEALTH EDUCATION

"American Journal of Public Health, May 1934". "From Chairman of Public Health Education Section:

Recognizing that much of the public health progress of the future will depend upon the development of successful methods of health education, the American Public Health Association some years ago organized the Public Health Education Section. Health edu-

cation is rapidly becoming a specialty within public health. It is a necessity for both adults and school children. It plays an important role in health departments, schools, voluntary health associations, both local and national."

THE CENTRAL OFFICE OF THE DIVISION OF PUBLIC HEALTH
EDUCATION AT BATAVIA

The work of the Office of the Division of Public Health Education, which is one of the Divisions of the Head Office of the Public Health Service of the Netherlands East Indies, is divided into the following sections:

- I. Administration: good administration; correspondence; administration of the demonstration carts; administration of stocks; preparation of reports; preparation of forms and other printed matter.
- II. Equipment and Materials: the designing, manufacture, and distribution of materials; demonstration charts; lantern slides, photographs, films, bulletins, etc., and supervision of the upkeep of material in general.
- III. Film and Photographic work: photographs; colored and uncolored lantern slides; enlargements; reproductions; colored photographs; the preparation of films including taking, printing, cutting-in of titles, editing, reconditioning, etc.
- IV. Studies: the study and testing of materials and methods.

The material prepared by this Division must appeal primarily to the people as human beings and not as inhabitants of any special part of the world, because it is to be used with methods which aim at the ideal of stimulating and not driving them to adopt more hygienic habits of life.

In the film and photograph studio all sorts of photographic work is done; photographs, prints, enlargements, reductions, reproductions, and lantern slides are made; lantern slides and photographs are colored.

The film work consists of the development of negative film; copying of films; developing and mounting of the copies; the printing and preparation of titles; and the complete preparation of films for distribution. Copies of films which have been in distribution must be returned to be reconditioned and prepared for redistribution.



A satisfactory handcart for transporting
film projectors, lanterns, etc.





Unsatisfactory vehicles for transporting
films, projectors, etc.



In the art studio, drawing and color work department, there is a carpenter shop, in which models, exhibits, and other materials are made. The draftsmen of the studio give much time to working out in detail ideas for new demonstration charts, permanent portable exhibits, etc.

In the print shop of the Division forms, film titles, title cards for exhibits, bulletins, etc., are printed. Books can be bound, photographs and charts framed, and blank books prepared.

Many forms are made and distributed for the collection of data which are used for studying the results obtained with the materials and methods, the type of work which is being conducted, and the extension and development of the work. *It is important that the field workers have the proper sort of forms, so that there will not be too much form reporting, and yet enough to collect the proper data which will give an accurate idea of the work done and the results obtained. For this reason the forms must often be revised and improved.*

Some of the forms issued by the Division are: general survey; inspection of houses, schools, latrines, etc.; day, week, and month reports: reports for hygiene mantris, midwives, laboratory technicians, etc., for registration of medical examination of school children; birth certificates and death certificates; reports on the use of films, apparatus, etc. *By supplying these forms the reports from the various field stations are more uniform; the information is of the proper sort; and the tendency to use too many forms locally is lessened.*

Another reason why it is so important that the Division of Public Health Education supply forms free of charge is that very often a local council is quite willing to supply funds for personnel, but not willing to supply an appropriation large enough to pay for properly printed forms. For example, the use of the birth and death certificate systems has been made possible by supplying the forms from this central office.

REPORTS FROM THE FIELD

The director of hygiene work in an area receives from his personnel the daily, weekly, and monthly reports, and prepares with these as a basis, a monthly or a quarterly report which he submits to the residency doctor. The residency doctor includes these reports in his quarterly report which he submits to the Inspector of the Province.

SPECIAL FILM SHOWS

In the Office of the Division of Public Health Education at Batavia there is a small film hall which is used especially for editing old and new films and for the ordinary work of the film studio, but is also used to show hygiene films for special groups, such as teachers, clubs, special meetings, et cetera.

On the Koningsplein, the great open field in the middle of the City of Batavia-Centrum, there is a film cabine and projector and a large screen built by the Division of Public Health Education. Hygiene films are shown here in the open air once a week. It is of course, very difficult to estimate how much people learn from seeing these films and although the general opinion is that they learn very little, a recent experiment has shown that they do learn a few facts from these films. Since the attendance is always so great, these film shows have been continued.

EXHIBITS

Formerly much time was given to the preparation of material for country and city fairs, large exhibits were prepared for the annual fair at Batavia and for some of the other large fairs of the towns of Java. Lately no funds have been appropriated by the Division of Health Education for this work. The results secured by exhibits at fairs are also difficult to estimate and are most probably not in proportion to the great cost of the exhibits. *Visitors at annual fairs come more for pleasure and amusement and are not in a frame of mind to learn hygiene.* Moreover, they give far too little time to the exhibit on hygiene to learn anything from it.

The Division has, however, prepared a few small complete portable exhibits on different subjects. These exhibits consist of photographs, drawings, models, etc., and are supplied upon request to people who desire to have an exhibit at a fair.

MUSEUM

Several years ago the Division of Public Health Education collected material and organized a museum. The exhibits of this museum consisted of photographs, charts, drawings, graphs, models, and other exhibit materials. The sections were arranged so as to give a good idea of the most prevalent diseases, their causes, symptoms, signs, results, transmission, treatment, and prevention.

The experience with this museum was similar to that reported

by other hygiene workers in other countries. The interest for the museum among the people was not great. Groups of people were invited to come and were from time to time brought to the museum; school children were brought and their transportation furnished; but the interest disappeared very quickly and the museum was finally closed.

CHILDREN'S HEALTH CLUBS

In 1929 there was included in the program of the Public Health Service of the Netherlands East Indies the organization of children's health clubs which should carry on activities similar to those of the Hygiene Clubs, Health Clubs, and Health Crusaders of the United States and other countries. Since the activities of such organizations can not be permanently included in the program of a Health Service, but are best carried out by private initiative and private organizations, it was planned that the Service would only stimulate the organization of these clubs.

Therefore in 1935 the clubs were taken over by the Red Cross Association and their activities included in those of the Netherlands Indian Junior Red Cross.

Children are always interested in parades, badges, flags, ribbons, etc., but their interest also disappears very quickly. They give their attention more to the spectacular things and not enough to hygiene habits and to the difficult practical hygiene. Also the health clubs contain more the idea of a club of which the children must become members while real hygiene work must be directed to every school child and not only to the members of a club. Hygiene work, especially that which is carried out by a Government, must be absolutely unprejudiced, must reach every child, and not be directed to a special group.

It is said that the child learns easily. This is true, but a child also forgets easily and it is just this ability to learn easily which for so many years deceived those who were carrying out child health club work in America. It was a great disappointment to see the children who had learned everything so beautifully at school, return to their old unhygienic habits as soon as they came under the influence of their parents.

Some have even proposed that the child should learn hygiene and should teach its parents. This is an attractive theory, but the practice is disappointing. All parents have naturally the feeling that they know much more than their children and this feeling can not

be easily overcome by the children. Modern children find it difficult enough to convince their parents that their modern ideas are correct

It is necessary therefore that hygiene work for the children be carried out together with hygiene work for the adults. Intensive hygiene work that secures good results is so difficult that the directors of campaigns are sometimes inclined to search for easier methods, but it would be a great pity, if in any area intensive hygiene work should be postponed on account of the organization of the children's health clubs.

In different places in Java intensified hygiene work in the schools is carried out, but the activities are carried on by the school teachers who, before they begin their programs, first follow a course in hygiene by the director of that area. In this hygiene work no flags or badges or ribbons or gold stars or rewards of any sort are used, but hygiene is considered a part of the general school program and efforts are made to make *the child understand that good health is his reward for adopting hygienic habits.*

PATIENCE AND EDUCATION

All hygiene work whether for children or adults, regardless of method, must be based on patience. The cooperation of the people must be secured through their realization of the need of the work and this, of course, is secured only after they understand why hygienic habits are valuable.

PREVIOUS PUBLICATIONS

The principles and the development of intensive hygiene work and public health education in the Netherlands East Indies have been described in four previous publications:

- (1) "Medische Propaganda door den Dienst der Volksgezondheid" 1927;
- (2) "De Afdeling Medisch-Hygiënische Propaganda van den Dienst der Volksgezondheid" 22 August 1929;
- (3) "The Division of Public Health Education of the Public Health Service of the Netherlands East Indies" August 1929;
- (4) "Intensief Hygiene Werk en Medisch-Hygiënische Propaganda van den Dienst der Volksgezondheid in Nederlandsch-Indië" February 1936.

Methods employed in intensive hygiene and public health educational work must be adapted to local conditions. Those used with success in cities are not always applicable to rural areas, and in rural areas the density of population, economic conditions, literacy, and many other factors influence the details of methods and work programs.

This booklet concerns methods adapted to the conditions in the Netherlands East Indies and especially in Java.



